5-6115-339-34

TM 5-6115-339-34

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

DIRECT AND GENERAL SUPPORT

MAINTENANCE MANUAL

GENERATOR SET, GAS TURBINE ENGINE:

60 KW, AC, 120/208, 240/416 V, 3 PHASE, 4 WIRE

SKID MOUNTED, WINTERIZED (AIRESEARCH MODEL)

(GTGE 70-9-2) FSN 6115-758-5492

HEADQUARTERS, DEPARTMENT OF THE ARMY

OCTOBER 1971

READEX FICHE best copy available

D 101.11:

WARNING

Take particular heed to specific cautions and warnings throughout this manual.

HIGH VOLTAGE

is used in the operation of this equipment

DEATH

or severe burns may result if personnel fail to observe safety precautions.
Do not operate this generator set until the ground terminal stud has been connected to a suitable ground.

Disconnect the battery ground cable before removing and installing components on engine or in electrical control panel system.

Before making kilowatt load connections for parallel operation, be sure the generator sets are not operating and main circuit breakers are in the OFF position.

Do not attempt to change load connects when generator is running.

Before servicing any part of a generator set, make sure unit is completely deenergized.

DANGEROUS GASES

are generated as a result of operating of this equipment

DEATH

or severe injury may result if personnel fail to observe safety precautions.

Utilize extreme caution, do not smoke, or use open flame in vicinity when servicing batteries.

Batteries generate explosive gas during charging.

Always maintain metal to metal contact when filling the fuel tank

Do not smoke or use open flame in vicinity when filling the fuel tank.

Do not attempt to fill fuel tank when generator is running.

Do not operate generator sets in inclosed areas unless exhaust gases are properly vented to the outside. Exhaust discharge contain noxious and deadly fumes.

Use extreme care, should a selenium rectifier malfunction, to avoid inhalation of poisonous fumes.

LIQUIDS UNDER PRESSURE

are generated as a result of operation of this equipment

INJURY

or severe burns may result if personnel fail to observe safety precautions.

CAUTION

DAMAGE

to the equipment may result if personnel fail to observe safety precautions.

When removing one of two generator sets operating in parallel, insure the load on the service lines is not greater than the rating of the remaining unit.

If generator set is shut-down by the operation of a safety device, do not attempt to operate unit until the cause has been determined and eliminated.

TECHNICAL MANUAL
No. 5-6115-339-34

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *28 October 1971*

DIRECT AND GENERAL SUPPORT MAINTENANCE MANUAL

GENERATOR SET, GAS TURBINE ENGINE: 60 KW, AC, 120/208, 240/416 V, 3 PHASE, 4 WIRE SKID MOUNTED, WINTERIZED (AIRESEARCH MODEL GTGE 70-9-2) FSN 6115-758-5492

			Paragraph	Page
LIST OF ILLUSTRATIONS				ii
CHAPTER	1.	INTRODUCTION		1-1
Section	I.	General	1-1	1-1
	II.	Description and data	1-5	1-1
CHAPTER	2.	DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE		
Section	I.	Repair parts, special tools and equipment	2-1	2-1
	II.	Troubleshooting	2-4	2-8
	III.	General maintenance	2-7	2-23
	IV.	Removal and installation of major components	2-11	2-25
CHAPTER	3.	REPAIR OF THE ENGINE		
Section	I.	Engine wiring and plumbing	3-1	3-1
	II.	Engine accessories	3-5	3-11
	III.	Engine combustion assembly and turbine assembly	3-19	3-34
	IV.	Accessory assembly and planetary gear assembly	3-22	3-43
	V.	Compressor assembly	3-25	3-48
CHAPTER	4.	REPAIR OF ELECTRICAL SYSTEM		
Section	I.	AC generator and voltage regulator	4-1	4-1
	II.	AC electrical system components	4-3	4-5
	III.	Electrical controls instrument panel and electrical equipment rack assembly	4-11	4-13
	IV.	Alternating current receptacles	4-13	4-17
	V.	Wiring harness	4-16	4-19
	VI.	Battery charger and 24 VDC receptacle	4-20	4-27
CHAPTER	5.	REPAIR OF FUEL SUPPLY SYSTEM		
Section	I.	Fuel supply system wiring and plumbing installation	5-1	5-1
	II.	Fuel supply system accessories	5-4	5-12
	III.	Engine lubricant filtering system	5-15	5-26
CHAPTER	6.	REPAIR OF WINTERIZATION EQUIPMENT	6-1	6-1
APPENDIX	A.	REFERENCES		A-1
INDEX				I-1

---

* This manual supersedes TM 5-6115-339-35, 12 August 1966 including C 1, 8 April 1969.

LIST OF ILLUSTRATIONS

Number	*Title*	*Page*
2-1	Specially designed fuel control unit filter cup	2-2
2-2	Specially designed fuel control unit integrator valve cover plate	2-3
2-3	Specially designed test box	2-4
2-4	Specially designed remote control test panel	2-5
2-5	Specially designed exciter field current measurement harness	2-6
2-6	Specially designed generator exciter field current control	2-7
2-7	Connecting analyzer to generator set (Sheet 1 of 3)	2-9
2-7	Connecting analyzer to generator set (Sheet 2 of 3)	2-10
2-7	Connecting analyzer to generator set (Sheet 3 of 3)	2-12
2-8	Analyzer controls and instrument panel	2-14
2-9	Engine operating stand clear area	2-15
2-10	Tachometer indication to turbine wheel rpm conversion chart	2-17
2-11	Gas turbine engine removal and installation (Sheet 1 of 4)	2-27
2-11	Gas turbine engine removal and installation (Sheet 2 of 4)	2-28
2-11	Gas turbine engine removal and installation (Sheet 3 of 4)	2-29
2-11	Gas turbine engine removal and installation (Sheet 4 of 4)	2-30
2-12	Ac generator and engine stand assembly removal and installation	2-31
2-13	Installation of gas turbine engine in portable stand	2-32
2-14	Fuel tank assembly removal and installation	2-34
3-1	Engine branched wiring harness assembly and igniter plug electrical lead assembly, removal and installation	3-2
3-2	Engine branched wiring harness components	3-4
3-3	Engine branched wiring harness wire identification	3-6
3-4	Hose and tube assemblies and plumbing fittings, removal and installation (Sheet 1 of 2)	3-8
3-4	Hose and tube assemblies and plumbing fittings, removal and installation (Sheet 2 of 2)	3-10
3-5	Starter clutch, exploded view	3-14
3-6	Starter motor, exploded view	3-15
3-7	Starter motor schematic diagram	3-16
3-8	Using clutch torquing holder and torque wrench adapter to check clutch slip torque	3-16
3-9	Starter motor test setup	3-16
3-10	Fuel control unit, removal and installation	3-17
3-11	Low oil pressure switch removal and installation	3-19
3-12	Low oil pressure switch adjustment	3-20
3-13	Oil pressure sequencing switch removal and installation	3-22
3-14	Oil pressure sequencing switch test setup and schematic wiring diagram	3-23
3-15	Tachometer generator removal and installation	3-24
3-16	Centrifugal switch assembly removal and installation	3-25
3-17	Centrifugal switch disassembly and reassembly	3-26
3-18	Oil tank assembly removal and installation	3-27
3-19	Oil tank assembly, exploded view	3-28
3-20	Oil pump assembly removal and installation	3-30
3-21	Oil pump assembly disassembly and reassembly	3-31
3-22	Acceleration and overtemperature control thermostat removal and installation	3-32
3-23	Acceleration and overtemperature disassembly and reassembly	3-33
3-24	Thermocouple removal and installation	3-34
3-25	Combustion assembly removal and installation	3-35
3-26	Combustion chamber assembly repair	3-36
3-27	Muffler assembly repair	3-37
3-28	Turbine plenum repair	3-38
3-29	Turbine plenum alinement	3-39
3-30	Turbine assembly removal and installation	3-40
3-31	Turbine assembly, disassembly and reassembly	3-41
3-32	Inspection of turbine shaft	3-42
3-33	Inspection of nozzle and shroud assembly for cracks	3-42
3-34	Accessory assembly removal and installation	3-44
3-35	Accessory assembly, disassembly and reassembly	3-46
3-36	Planetary gear assembly, removal and installation	3-48
3-37	Compressor removal and installation	3-49
3-38	Compressor inlet plenum repair	3-50
4-1	AC generator disassembly and reassembly	4-2
4-2	AC generator testing, schematic diagram	4-4
4-3	AC wiring harness removal and installation.	4-6
4-4	Wiring harness assembly wire location (Sheet 1 of 2)	4-7

LIST OF ILLUSTRATIONS—Continued

Number	*Title*	*Page*
4-4	Wiring harness assembly wire location (Sheet 2 of 2)	4-8
4-5	Voltage regulator, load anticipator and terminal boards removal and installation	4-9
4-6	Current transformer removal and installation	4-10
4-7	Voltage change panel assembly removal and installation	4-11
4-8	Overcurrent relay and main circuit breaker removal and installation	4-12
4-9	Electrical controls instruments panel removal and installation	4-14
4-10	Electrical equipment rack removal and installation	4-15
4-11	Electrical equipment rack assembly, exploded view	4-16
4-12	AC receptacles, removal and installation	4-18
4-13	Generator set protected dc wiring harness wire location chart	4-20
4-14	Generator set unprotected wiring harness wire location chart	4-21
4-15	Cubicle ac branched wiring harness, removal and installation	4-22
4-16	Cubicle ac branched wiring harness wire location chart	4-24
4-17	Cubicle dc branched wiring harness removal and installation	4-25
4-18	Cubicle dc branched wiring harness wire location chart	4-26
4-19	Battery charger removal and installation	4-28
4-20	24 V DC slave receptacle, exploded view	4-29
5-1	Fuel tank base wiring harness removal and installation	5-2
5-2	Fuel tank base wiring harness components	5-4
5-3	Fuel tank base wiring harness wiring diagram and wire identification chart	5-5
5-4	Hose and tube assemblies and plumbing fittings removal and installation (Sheet 1 of 4)	5-7
5-4	Hose and tube assemblies and plumbing fittings removal and installation (Sheet 2 of 4)	5-8
5-4	Hose and tube assemblies and plumbing fittings removal and installation (Sheet 3 of 4)	5-9
5-4	Hose and tube assemblies and plumbing fittings removal and installation (Sheet 4 of 4)	5-10
5-5	Fuel supply system accessories removal and installation (Sheet 1 of 4)	5-13
5-5	Fuel supply system accessories removal and installation (Sheet 2 of 4)	5-14
5-5	Fuel supply system accessories removal and installation (Sheet 3 of 4)	5-15
5-5	Fuel supply system accessories removal and installation (Sheet 4 of 4)	5-16
5-6	Fuel tank assembly, exploded view	5-20
5-7	Tank enclosure assembly, exploded view	5-22
5-8	Fuel tank enclosure marking and painting instructions (Sheet 1 of 2)	5-24
5-8	Fuel tank enclosure marking and painting instructions (Sheet 2 of 2)	5-24
5-9	Engine lubricant filtering system, exploded view	5-28
6-1	Winterization equipment, exploded view	6-2
6-2	Battery heater, exploded view	6-4
6-3	Battery heater electrical wiring schematic	6-7
6-4	Flame switch continuity check and adjustment	6-7
FO-1	Generator set schematic wiring diagram (Sheet 1 of 7)	FO-1
FO-1	Generator set schematic wiring diagram (Sheet 2 of 7)	FO-1
FO-1	Generator set schematic wiring diagram (Sheet 3 of 7)	FO-1
FO-1	Generator set schematic wiring diagram (Sheet 4 of 7)	FO-1
FO-1	Generator set schematic wiring diagram (Sheet 5 of 7)	FO-1
FO-1	Generator set schematic wiring diagram (Sheet 6 of 7)	FO-1
FO-1	Generator set schematic wiring diagram (Sheet 7 of 7)	FO-1
FO-2	Generator set practical wiring diagram (Sheet 1 of 5)	FO-2
FO-2	Generator set practical wiring diagram (Sheet 2 of 5)	FO-2
FO-2	Generator set practical wiring diagram (Sheet 3 of 5)	FO-2
FO-2	Generator set practical wiring diagram (Sheet 4 of 5)	FO-2
FO-2	Generator set practical wiring diagram (Sheet 5 of 5)	FO-2
FO-3	Generator set wiring harness assembly	FO-3

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual contains instructions for the use of direct and general support maintenance personnel maintaining, the Airesearch Model GTGE 70-9-2 Generator Sets, part number 13207E3830-1, serial numbers P-21551 through P-21560. Generator Sets part number 13207E3830-2, serial numbers 21567 through 21633, will retain their serial numbers after being modified into part number 13207E3830-3 by addition of the fuel vent system covered in chapter 5, section 1 of this manual. The only difference in the part number 13207E3830-2 and 13207E3830-3 is the fuel vent system added to part number 13207E3830-3.

1-2. Maintenance Forms and Records

Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

1-3. Equipment Serviceability Criteria (ESC)

This equipment is not covered by an ESC.

1-4. Reporting of Errors

Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028, Recommended Changes to Publications, and forwarded direct to Commanding General, U. S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Blvd, St. Louis, Mo. 63120.

Section II. DESCRIPTION AND DATA

1-5. Description

A general description of the generator set, the location and description of the identification and instruction plates, and information on the differences in models are contained in TM 5-6115-339-12.

1-6. Tabulated Data

a. General. This paragraph contains all repair data pertinent to direct and general support maintenance personnel. A schematic diagram (FO-1) (Located in back of manual) and a practical wiring diagram (FO-2) (Located in back of manual) are included to aid maintenance personnel.

b. Fuel Control Unit.

Governor type	Isochronous
Trim control	Electric
Pump type	Gear
Lubrication	Fuel
Shaft rotation	Clockwise
Fuel pump relief valve setting	375 to 475 psig
Weight	10.75 lbs (dry)
Acceleration limiter valve cracking pressure	38 to 39 psig
Governor trim control motor:	
Voltage	24 vdc
Current	312 milliamps (max) 156 milliamps (min)

c. Oil Pressure Sequencing Switch.

Current capacity	4 amps at 30 vdc
Proof pressure	250 psig
Actuation	2.5 to 3.5 psig
Deactuation	1.5 psig

d. Low Oil Pressure Switch.

Current capacity	4 amps at 14 to vdc
Proof pressure	250 psig
Actuation	65 psig
Deactuation	55±3 psig

e. Thermostat Bypass Solenoid Valve.

Normal valve position	Open
Operating pressure	0 to 400 psig
Operating voltage	11 to 30 vdc
Operating current	1.0 amp at 28 vdc
Drop out voltage	4 vdc

f. Starter Assembly.

Horsepower	1.5
Operating voltage	24 vdc
No load test:	
Voltage	27.5±0.5 vdc
Current	50 amperes
Speed	18,000 to 25,000 rpm
Rated load test:	
Voltage	27.5±0.5 vdc
Current	135 amperes
Speed	4,500 to 5,500 rpm

g. Repair and Replacement Standards. Table 1-1 lists manufacturer's dimensions and tolerances.

h. Nut and Bolt Torque Data.

Engine:	
Compressor:	
Oil fitting bolts	20 to 25 inch-pounds
Turbine:	
Turbine plenum nuts (at turbine exhaust flange)	40 to 60 inch-pounds
Shroud bolts	45 to 50 inch-pounds
Accessory Drive:	
Attaching bolts	50 to 70 inch-pounds
Output shaft	145 to 155 inch-pounds
Rotating fan lower nut	150 to 175 inch-pounds
Rotating fan locknut	150- to 175 inch-pounds
Generator:	
End shield attaching screws	25 to 30 inch-pounds

i. Diagrams. **FO-1 and FO-2 (Located in back of manual) are the schematic and practical wiring diagrams respectively.**

Table 1-1. Repair and Replacement Standards

Component	Manufacturer's dimensions and tolerances in inches	
	Minimum	Maximum
Combustion Assembly:		
Combustion chamber flange in turbine torus to plenum assembly (to be shimmed toward turbine) (Shim with outer plenum gaskets)	0.000	0.060
Turbine exhaust flange to plenum flange (shim with turbine exhaust flange gaskets to obtain compression preload on plenum flange)	0.000	0.080
Accessory Assembly:		
Output shaft bearing to seal retainer (shim for pinch)	0.000	0.003
Output shaft seal rotor to seal carbon face (shim for pinch)	0.030	0.035

CHAPTER 2

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

Section I. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

2-1. Tools and Equipment

The special tools and equipment required to perform direct and general support maintenance on the generator set are listed in table 2-1 and TM 5-6115-339-35P.

2-2. Special Tools and Equipment

Specially designed tools and equipment required to perform maintenance on this generator set are listed in table 2-2 and illustrated in figures 2-1 through 2-6. These tools and equipment are not available for issue, but must be fabricated by direct and general support maintenance personnel.

2-3. Maintenance Repair Parts

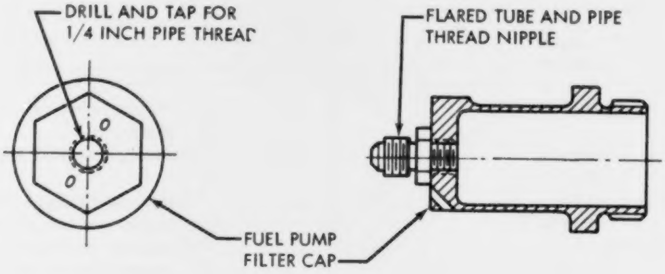
Repair parts and equipment are listed and illustrated in the repair parts and special tools list manual TM 5-6115-339-35P.

Table 2-1. Special Tools and Equipment

Item	FSN or Part No.	Reference		Use
		Figure	Paragraph	
Gas Turbine Engine Analyzer	4920-778-6091	2-7	2-5	Monitors operation of the gas turbine engine.
Beam Type-Adjustable sling	(99193) 281514-1		2-13	Hoisting enclosed generator set
Analyzer Hose Kit	(99193) 281605-2	2-7	2-5	Hoses and fittings to connect analyzer to gas turbine engine
Electrical Branched Special Purpose Cable Assembly	(99193) 281683-1	2-7	2-5	Connects analyzer to gas turbine engine control circuitry
Gas Turbine Engine Portable Stand	1730-961-3068	2-13	2-11	Supports gas turbine engine during disassembly and assembly
Maintenance Stand Adapter	4920-717-7019	2-13	2-11	Adapts engine side mount to portable stand
Maintenance Stand Adapter	(99193) 281329	2-13	2-11	Supports accessory end of engine in portable stand
Gas Turbine Engine Lower Mount	(99193) 281499-2		2-11	Supports lower part of engine in portable stand
Beam Type-Adjustment Sling	6115-731-0051	2-12	2-11	Hoisting gas turbine engine ac generator
Mechanical Fan Puller	5120-788-6118		3-23	Removal of fan from fan shaft assembly
Clutch Torquing Holder	4920-336-0648	3-8	3-6	Hold starter clutch housing while assembly clutch parts when checking clutch slip torque
Torque Wrench Adapter	5120-862-0049		3-6	Adapts a torque wrench to starter pawls for checking slip torque
Seal Mechanical Puller	5120-778-6119		3-16	Remove tachometer generator shaft seal from oil pump cover assembly.

Table 2-2. Fabricated Repair Parts

Item	Reference		Remarks
	Figure	Paragraph	
Filter Cap	2-1		Permit fuel to leave filter chamber without going into governor chamber during a portion of fuel control unit test.
Intergrator Valve Cover Plate	2-2		Permit observation and adjustment of integrator valve during fuel control unit test.
Test Box	2-3		Provides visual indication of master switch and internal circuit breaker circuits during generator set test.
Remote Control Test Panel	2-4		Provides remote control operation of generator set during test.
Exciter Field Current Measurement Harness	2-5		Provides wiring and ammeter to measure generator exciter field current during generator set test.
Generator Exciter Field Current Control	2-6		Provides wiring and components to control generator exciter field current during overvoltage and undervoltage tests of generator set.


DRILL AND TAP FOR 1/4 INCH PIPE THREAD
FLARED TUBE AND PIPE THREAD NIPPLE
FUEL PUMP FILTER CAP

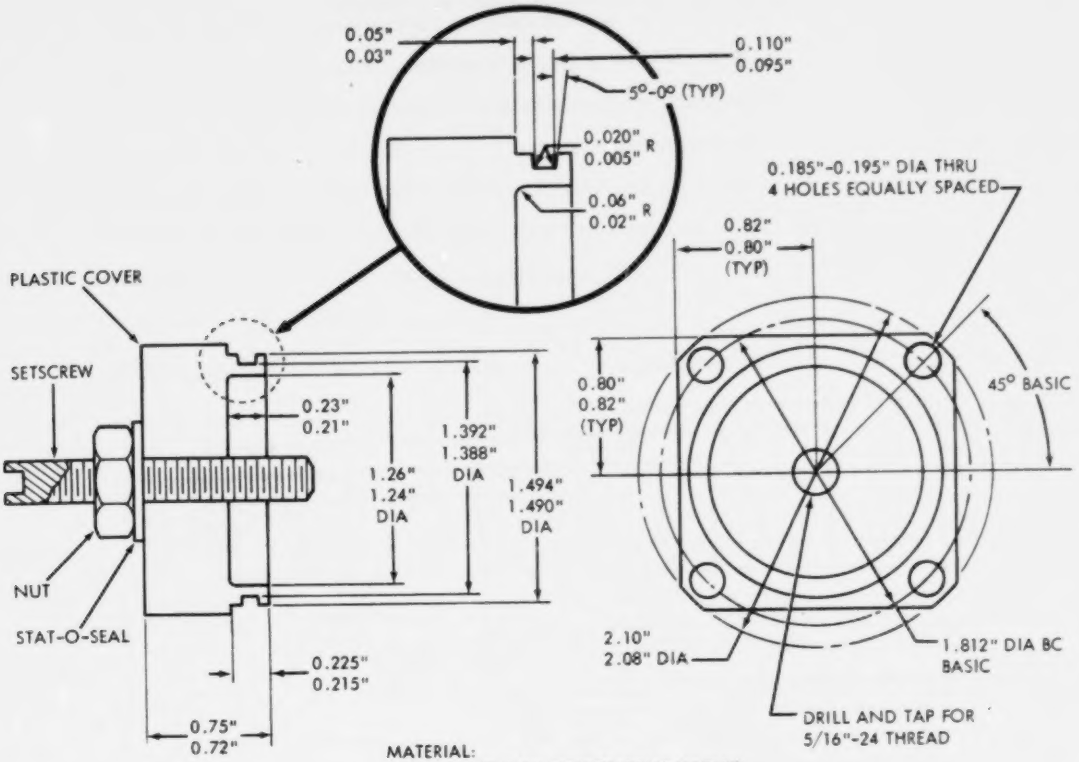
MATERIAL:

FUEL PUMP FILTER CAP AIRESEARCH PART NO. 73000

FLARED TUBE AND PIPE THREAD NIPPLE PART NO. AN816-6

ME 6115-339-34/2-1

Figure 2-1. Specially designed fuel control unit filter cap.



MATERIAL:
CLEAR PLASTIC (LUCITE OR EQUIVALENT)
1-3/4" X 1-3/4" X 3/4"

HEADLESS HEXAGON SOCKET SETSCREW
PART NO. AN565A524-32H32

PLAIN NUT PART NO. AN315-5R

STAT-0-SEAL PART NO. 600-015-5/16
(PARKER SEAL CO, CULVER CITY,
CALIFORNIA)

ME 6115-339-34/2-2

Figure 2-2. Specially designed fuel control unit integrator valve cover plate.

MATERIAL:
BOX 4" X 2-1/8" X 1-5/8" (LMB TYPE OO,
NEWARK ELECTRONICS CORP, 223 W. MADISON
ST, CHICAGO, ILLINOIS 60606, OR EQUIVALENT)

LIGHT ASSEMBLY (2) PART NO. MS25041-6-327

PLUG PART NO. MS3106-18-4P

WIRE (AR) PART NO. AWG18

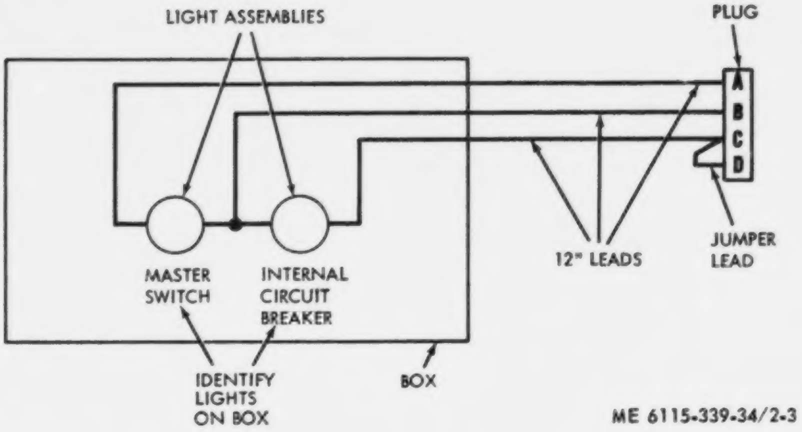


Figure 2-3. Specially designed test box.

MATERIALS:

BOX 10" X 8" X 5" (LMB TYPE 1085EL, NEWARK ELECTRONICS CORP, 223 W. MADISON ST, CHICAGO, ILLINOIS 60606, OR EQUIVALENT)

MASTER START SWITCH, PART NO. 13207E3748

AC CIRCUIT BREAKER SWITCH, DOUBLE POLE TOGGLE, PART NO. MS24524-27

VOLTMETER, PART NO. 13206E4590-1

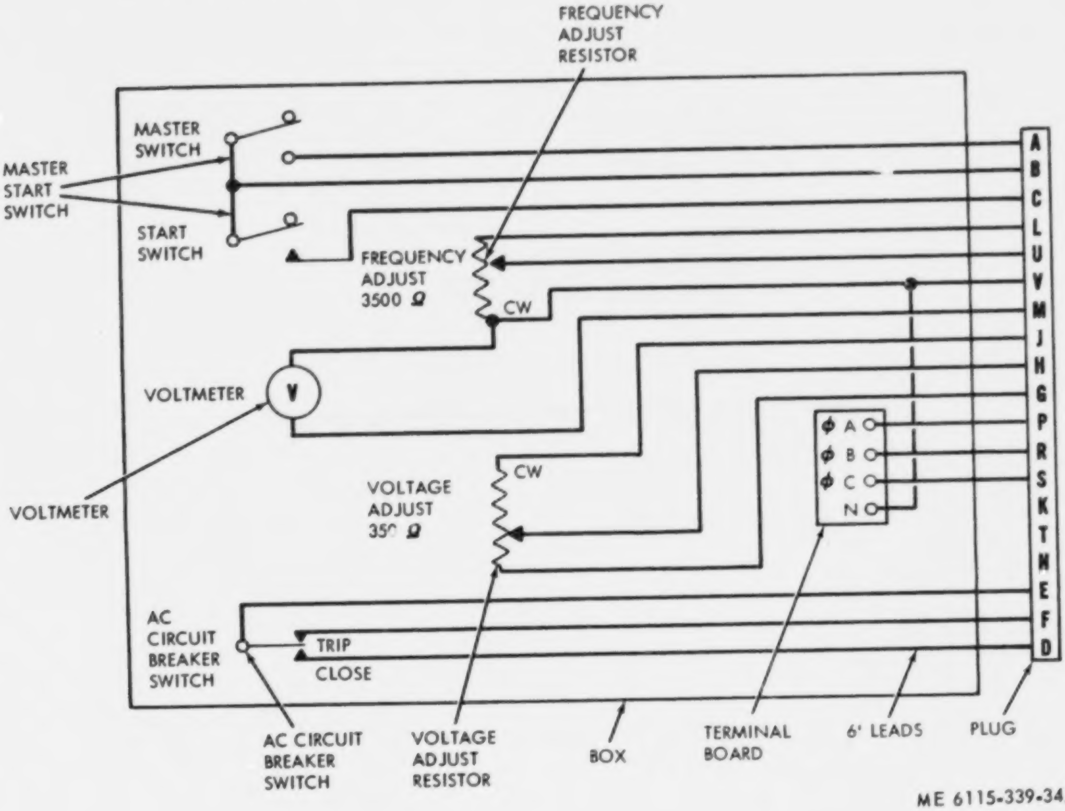
FREQUENCY ADJUST RESISTOR, WIRE WOUND VARIABLE, PART NO. MS35047

VOLTAGE ADJUST RESISTOR, WIRE WOUND POWER TYPE VARIABLE, PART NO. MS91428

TERMINAL BOARD ELECTRICAL, PART NO. MS25123-2-4

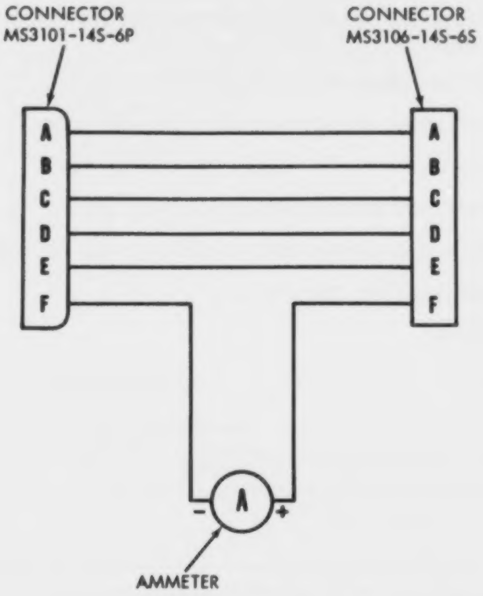
PLUG PART NO. MS3106-22-14P

WIRE (AR), PART NO. AWG18



ME 6115-339-34/2-4

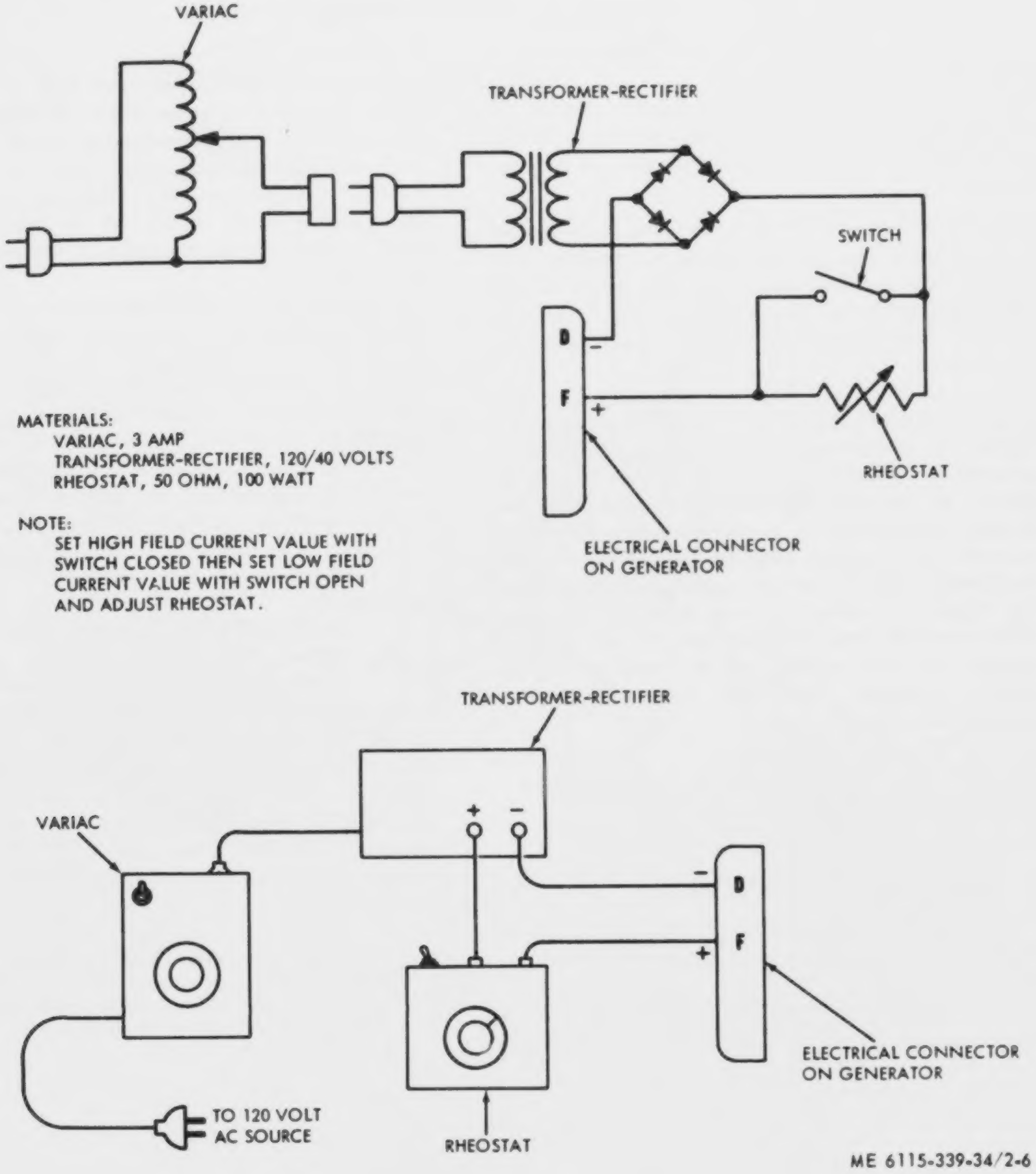
Figure 2-4. Specially designed remote control test panel.



MATERIAL:
CONNECTOR PART NO. MS3101-14S-6P
CONNECTOR PART NO. MS3106-14S-6S
AMMETER, RANGE 0 TO 5 AMPS
WIRE (AR) PART NO. AWG18

ME 6115-339-34/2-5

Figure 2-5. Specially designed exciter field current measurement harness.



MATERIALS:
VARIAC, 3 AMP
TRANSFORMER-RECTIFIER, 120/40 VOLTS
RHEOSTAT, 50 OHM, 100 WATT

NOTE:
SET HIGH FIELD CURRENT VALUE WITH SWITCH CLOSED THEN SET LOW FIELD CURRENT VALUE WITH SWITCH OPEN AND ADJUST RHEOSTAT.

Figure 2-6. Specially designed generator exciter field current control.

Section II. TROUBLESHOOTING

2-4. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the generator set or any of its components.

2-5. Use of Special Troubleshooting Equipment

a. General. The gas turbine engine analyzer is a portable test system which provides controls and instrumentation to check operation of the gas turbine engine and to isolate malfunctioning components.

b. Gas Turbine Engine Analyzer. The gas turbine engine analyzer provides electrical, hydraulic, and pneumatic test systems with their associated controls and instruments for functional testing of the gas turbine engine and malfunctioning components. A portable multimeter and a portable fuel pressure gage are provided for use in troubleshooting checks at various components on the engine. A special purpose electrical branched cable assembly and analyzer hose kit are used to connect the test systems of the analyzer to the engine. Perform functional testing with the analyzer as follows:

NOTE

These instructions apply only to gas turbine engine analyzer, Airesearch part number 281069-1, FSN 4930-778-6091 and gas turbine engine driven generator set, part number 13207E3830-1. For additional information on the use of the analyzer, refer to TM 5-4920-200-15.

(1) Refer to figure 2-7 and connect the engine analyzer to the generator set then proceed as follows:

(a) Install special purpose electrical branched cable assembly (16) on MAIN receptacle of analyzer panel and connect into generator set engine control wiring harness as designated on the cable assembly connectors and as shown in figure 2-7. Install light identification plate (6, fig. 2-8), attached to cable assembly, over analyzer indicator lights as shown in figure 2-8 to provide correct identification of analyzer lights, switches, and static test jacks.

(b) Remove trim control connector (24, fig. 2-7) from governor trim control motor and install trim control electrical lead (18).

(c) Install thermocouple harness provided with the analyzer. Connect thermocouple harness to THERMOCOUPLE receptacle on analyzer.

(d) Use hoses and fittings from analyzer hose kit to connect fuel, oil, and air components to analyzer as shown in figure 2-7 and 2-8. Close AIR VALVE (5, fig. 2-8) on analyzer panel.

(2) Perform static check of engine components as follows:

(a) Place all analyzer switches in OFF or spring loaded position.

(b) Place generator set controls in normal local operation position (TM 5-6115-339-12) with MASTER switch in RUN position.

(c) Insert static test lead (7, fig. 2-8) in appropriate test jack for the component to be checked (as identified on the light identification plate (6)) actuate static check switch (12). The component being checked may be heard or felt to actuate.

NOTE

The multimeter provided with the analyzer may be connected in series with the static test lead and actuation of the component being checked will be indicated on the multimeter ampere scale.

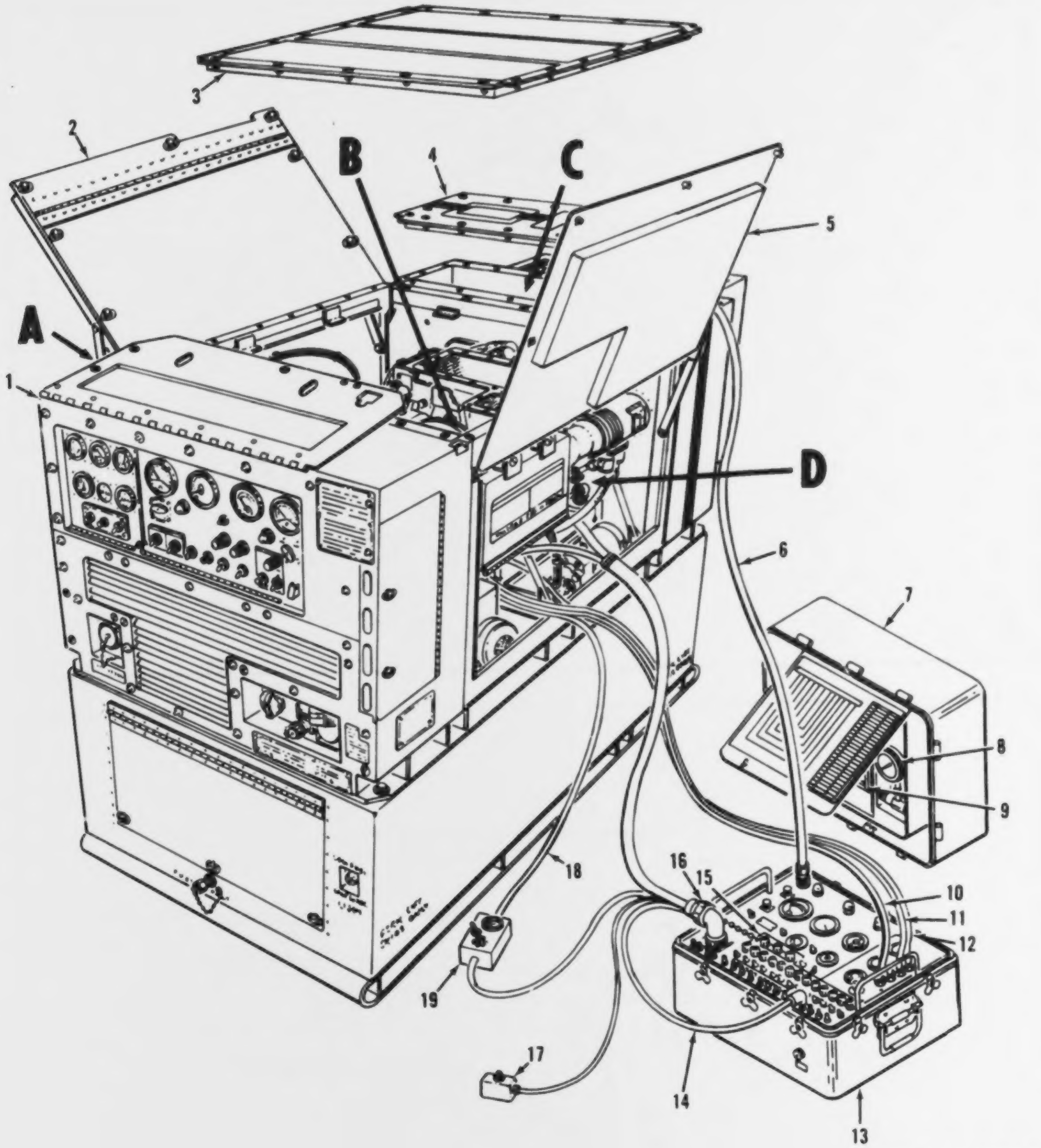
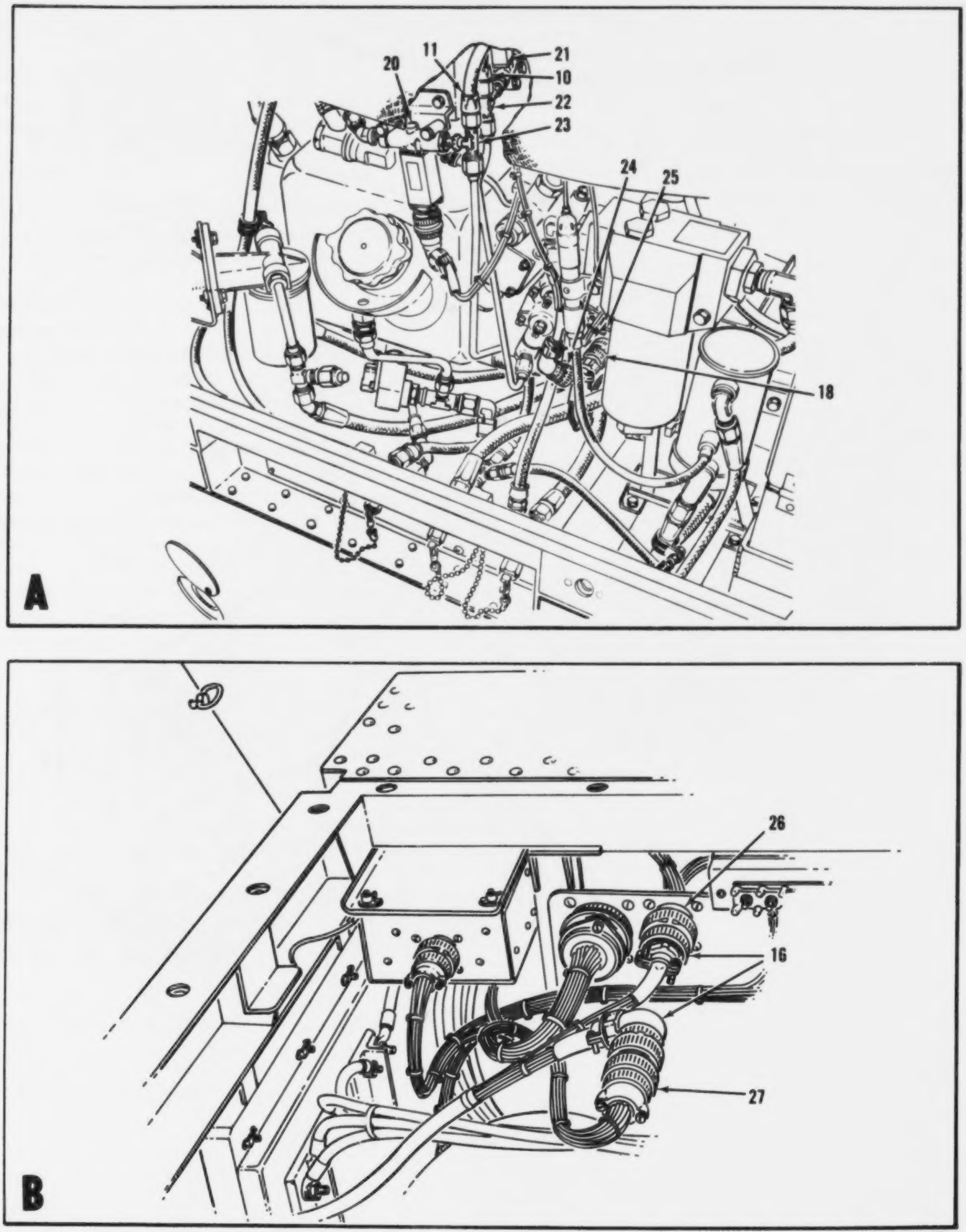
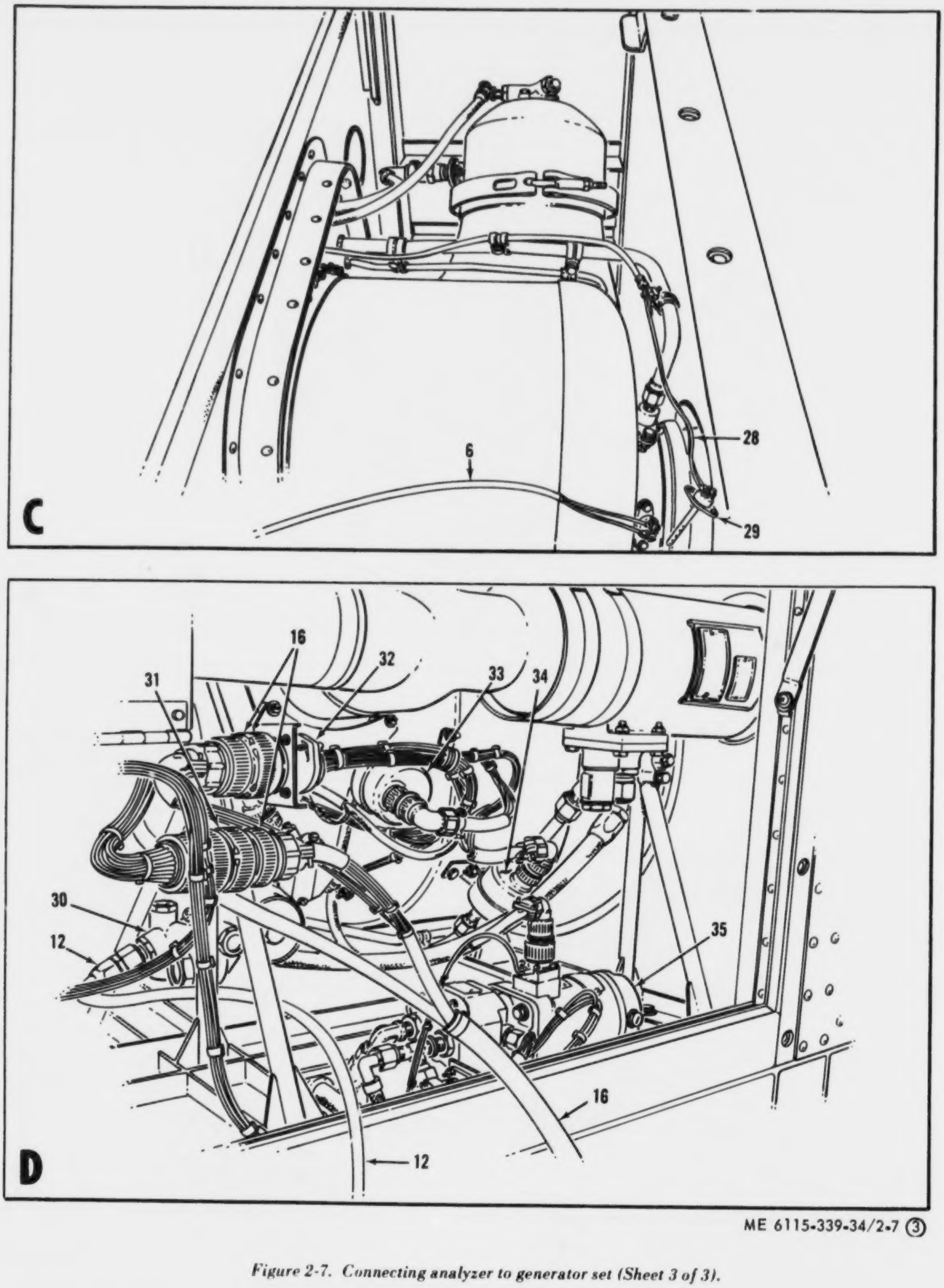


Figure 2-7. Connecting analyzer to generator set (Sheet 1 of 3).



ME 6115-339-34/2-7 ②

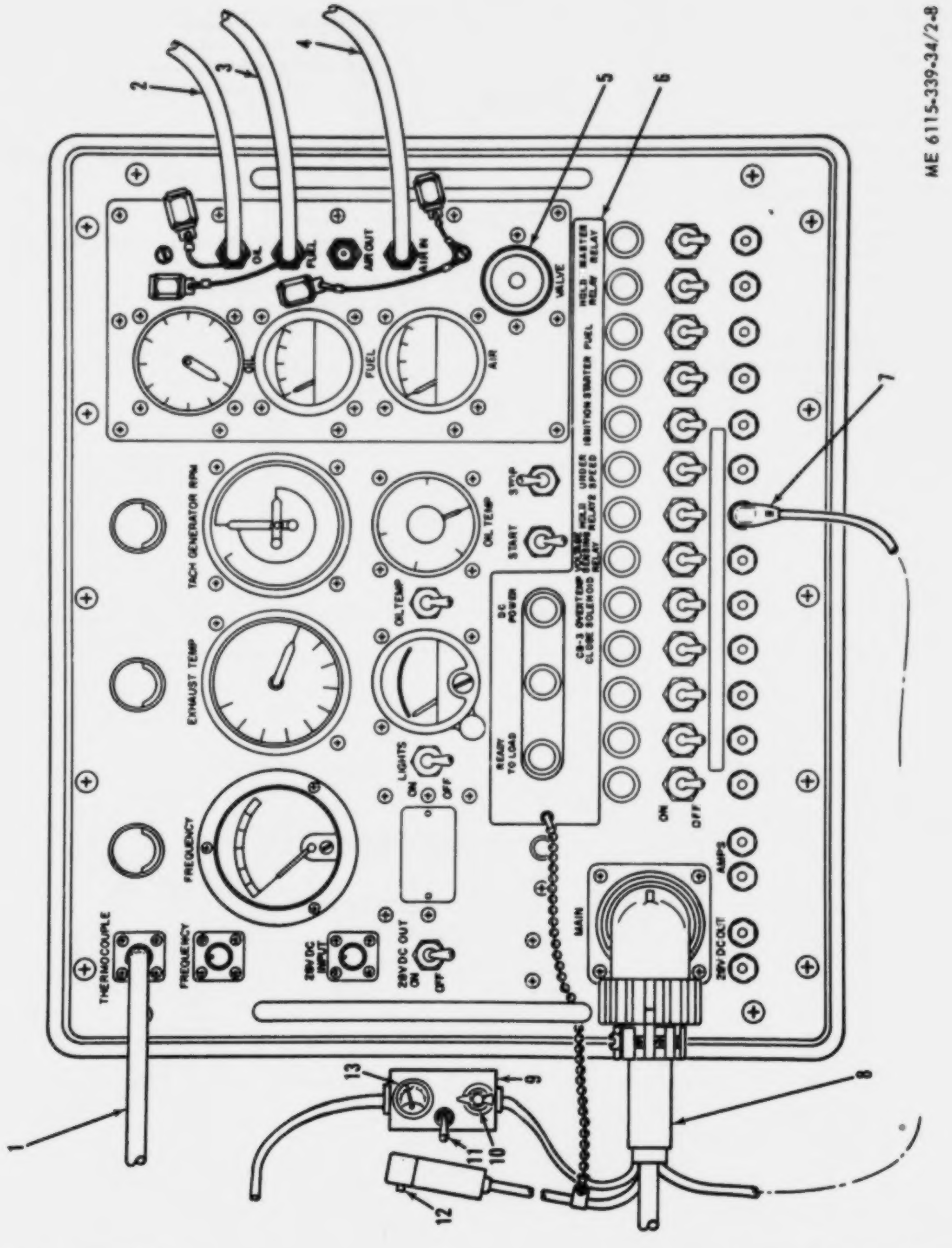
Figure 2-7. Connecting analyzer to generator set (Sheet 2 of 3).



ME 6115-339-34/2-7 ③

Figure 2-7. Connecting analyzer to generator set (Sheet 3 of 3).

Key to figure 2-7:
1. Generator set
2. Left side door
3. Top center panel
4. Aft top panel
5. Right side door
6. Thermocouple harness
7. Analyzer cover
8. Portable fuel pressure gage
9. Portable multimeter
10. Control air hose
11. Fuel pressure hose
12. Oil pressure hose
13. Analyzer
14. Static test lead
15. Light identification plate
16. Special purpose branched electrical cable
17. Static check switch
18. Control motor actuator
19. Control motor actuator
20. Fuel shutoff solenoid valve
21. Thermostat bypass solenoid valve
22. Tee
23. Tee
24. Engine wiring harness trim control connector
25. Governor trim control motor
26. Receptable P3
27. Connector J3
28. Engine wiring harness thermocouple leads
29. Engine thermocouple
30. Oil pump pressure port
31. Engine connector J2
32. Engine receptacle P2
33. Oil pressure sequencing switch
34. Low oil pressure switch
35. Main fuel pump



1. Thermocouple harness
2. Oil pressure hose
3. Fuel pressure hose
4. Control air hose
5. Air valve
6. Light identification plate
7. Static test lead
8. Special purpose branched electrical cable assembly
9. Control motor actuator assembly
10. Control motor actuator rheostat
11. Control motor actuator switch
12. Static check switch
13. Control motor actuator current meter

Figure 2-8. Analyzer controls and instruments panel.

(3) Perform functional check of engine starting and operation as follows:

WARNING

During generator set starting and operation, stand clear of the sides of the generator set at the area between the two red stripes and the danger areas designated in figure 2-9 and wear ear protection. Only qualified personnel should be permitted to operate, adjust, and service the generator set. Extreme care must be exercised to prevent debris or any other foreign material from entering the air inlet. Turbine or compressor failure induced by foreign material entering the generator set may be sufficiently violent to cause severe damage to internal components with possible danger to personnel in the immediate area.

High voltages are present during operation of the generator set. Death on contact may result if personnel fail to observe safety precautions. Be careful not to contact electrical connections when the generator set operating. In case of accident from electrical shock, shut down the equipment at once. If set cannot be shut down, free the victim from the live conductor with a board or any nonconductor. If the victim is unconscious, apply artificial respiration and seek medical help.

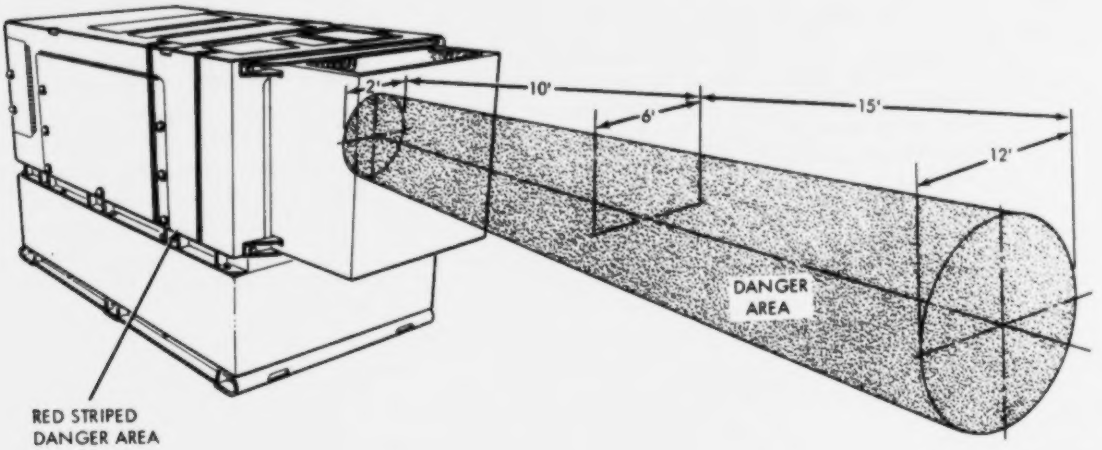
(a) Place all analyzer switches in the ON or spring-loaded position (START switch in spring-loaded OFF position).

(b) Place generator set controls in normal local operation position (TM 5-6115-339-12) with MASTER switch in RUN position. Place INTERNAL DC circuit breaker in closed position. The DC POWER and the MASTER RELAY lights on the analyzer should light and the main fuel pump will start.

(c) Momentarily place analyzer START switch or generator set MASTER switch in START position and note that the HOLD RELAY 1 light (fig. 2-8) illuminates indicating actuation of number 1 holding relay (K3). Also note that STARTER light illuminates indicating actuation of start relay (K1). At this time, the starter rotates gas turbine engine and the OIL pressure gage indicates rising oil pressure.

NOTE

Engine acceleration rate may be controlled by adjusting AIR VALVE (fig. 2-8) to bleed off fuel control unit control air to slow rate of acceleration during observation of the various actuation points.



ME 6115-339-34/2-9

Figure 2-9. Engine operating stand clear areas.

(d) When oil pressure reaches 2.5 to 3.5 psig, observe that the following occurs.

FUEL light (fig. 2-8) illuminates, indicating actuation of fuel shutoff solenoid valve to admit fuel to fuel atomizer assembly.

IGNITION light (fig. 2-8) illuminates, indicating ignition unit is energized.

UNDER SPEED light (fig. 2-8) illuminates, indicating an electrical signal through the ready to load switch in the centrifugal switch assembly. (Ignition holding circuit.)

(e) Combustion occurs and unit accelerates to approximately 35 percent governed rpm. (See fig. 2-10 for rpm to tachometer indication conversion.) Observe that the following occurs.

STARTER light (fig. 2-8) is extinguished, indicating actuation of the starter cutout switch in the centrifugal switch assembly and deactuation of the start relay and starter motor.

HOLD RELAY 1 light (fig. 2-8) remains illuminated and actuation of the low oil pressure switch at 55 to 65 psig will complete an additional holding circuit for holding relay number 1 (K3).

(f) Engine accelerates to approximately 95 percent governed speed. (See fig. 2-10 for rpm to tachometer indication conversion.) Observe that the following occurs.

IGNITION light (fig. 2-8) is extinguished, indicating that relay to load and ignition cutout switch in centrifugal switch assembly has actuated to energize holding relay 2 (K4) and ignition unit is deenergized.

HOLD RELAY 2 light (fig. 2-8) illuminates, indicating actuation of ready to load and ignition cutout switch in centrifugal switch assembly to energize holding relay 2 (K4) and READY TO LOAD light (fig. 2-6).

READY TO LOAD light (fig. 2-8) illuminates, indicating actuation of ready to load and ignition cutout switch in centrifugal switch assembly.

UNDER SPEED light (fig. 2-8) is extinguished, indicating actuation of ready to load and ignition cutout switch in centrifugal switch assembly.

(g) With engine operating at governed speed; perform the following checks.

Place PROTECTIVE BYPASS switch on generator set control panel in ON position and observe that OVERTEMP SOLENOID light (fig. 2-8) illuminates, indicating actuating current has been applied to the acceleration and overtemperature thermostat bypass solenoid valve.

Place PROTECTIVE BYPASS switch on generator set control panel in OFF position and secure protective cover. Observe that OVERTEMP SOLENOID light (fig. 2-8) is extinguished.

Adjust control motor actuator rheostat (10, figure 2-8) to deliver 312 millamperes (maximum). Actuate switch (11) to increase position and observe that engine rpm increases. Actuate switch (11) to decrease position and observe that engine rpm decreases.

Actuate MAIN CB circuit breaker switch on generator set electrical controls instruments panel to CLOSE position and observe that CB-3 CLOSE light illuminates, indicating closure of the main circuit breaker.

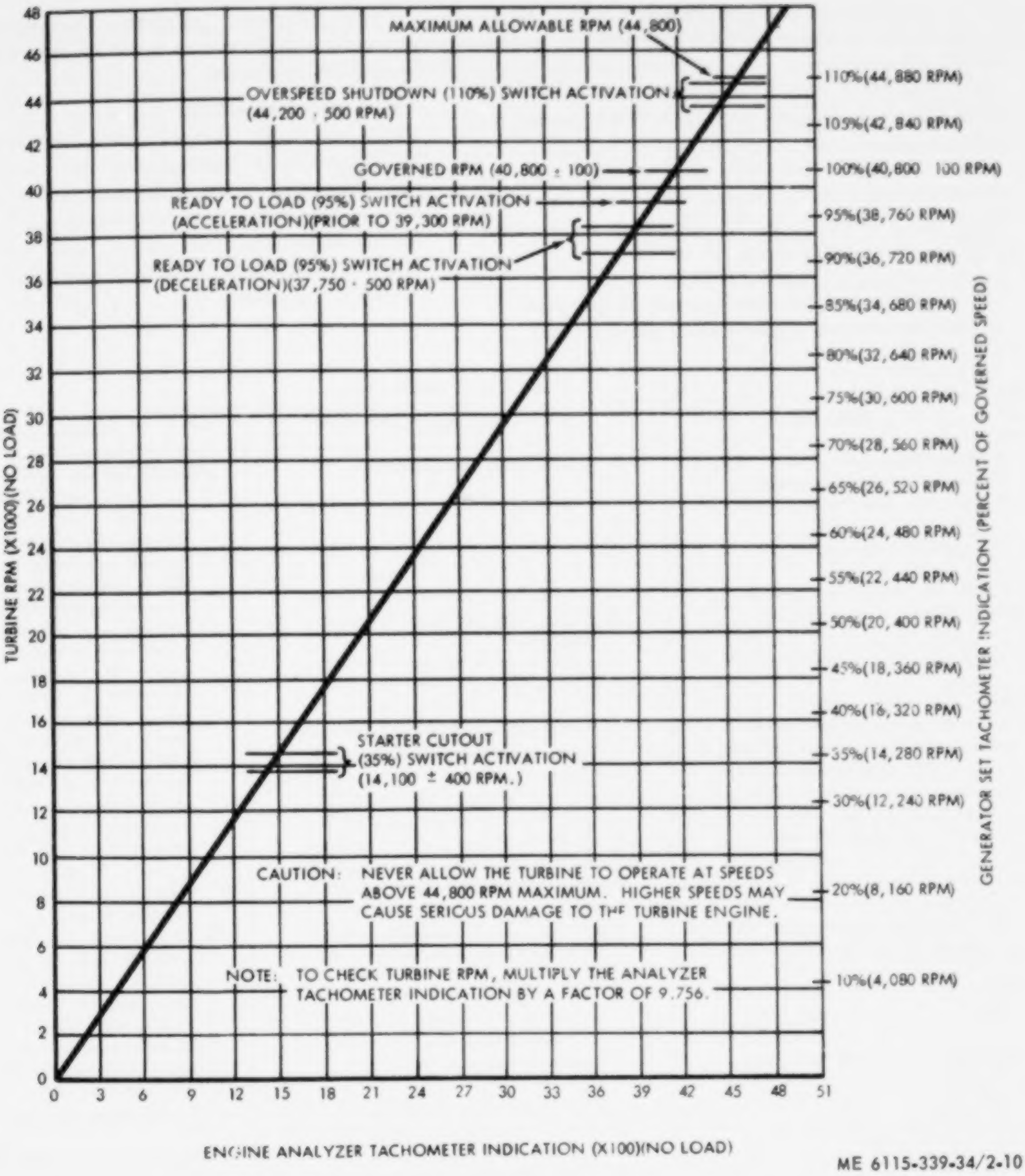


Figure 2-10. Tachometer indication to turbine wheel rpm conversion chart.

NOTE

VOLTAGE SENSING RELAY light (fig. 2-8) will illuminate only if the REMOTE-LOCAL VOLTAGE SENSING selector switch on the generator electrical controls instrument panel is placed in REMOTE position and switch is connected to electrical system (para 4-11), to indicate actuation of the remote-local sensing relay (K16).

(h) Actuate STOP switch (fig. 2-8) and observe that the engine shuts down.

(4) Perform check of acceleration limiter valve crack pressure setting as follows:

(a) Disconnect atomizer line and connect to portable fuel gage. Disconnect control air line at fuel control unit.

(b) Place all analyzer switches in the ON or spring-loaded position (START switch in spring-loaded off position).

(c) Place generator set controls in normal local operation position with MASTER switch in RUN position.

(d) Place START switch (fig. 2-8) in START position to motor unit and observe cracking pressure on FUEL gage. Cracking pressure must not exceed 38 to 39 psig.

CAUTION

Do not exceed starter motor duty cycle of one minute on and four minutes off.

(5) Remove analyzer connections from generator set in reverse order of installation using figure 2-8 as guide.

2-6. Troubleshooting

This paragraph (including chart 2-1) contains troubleshooting information for locating and correcting most of the maintenance problems which may develop in the generator set. Each malfunction for an individual component, unit, or system is followed by a list of probable causes and corrective action to be taken.

Chart 2-1. Troubleshooting

Malfunction	Probable Cause	Corrective Action
1. Main fuel pump and motor assembly fails to operate.	*a.* Master relay K2 defective.	*a.* Use 24-volt test light or multimeter to check for voltage between terminal 3 on rear of protection by-pass switch and generator set ground with master switch in RUN position. If no voltage is present, replace K2 (para 4-12).
	b. Pump and motor assembly defective.	*b.* Perform test procedure. If test indicates a defective pump, repair. If fuel pump and motor assembly is defective beyond repair, replace main fuel pump and motor assembly (para 5-11).
2. Auxiliary fuel pump and motor assembly fails to run.	*a.* Pump and motor assembly defective.	*a.* Perform test procedures. If test indicates a defective pump or motor, repair or replcce pump and motor assembly (para 5-5).
	b. Float switches, pump prime switch, or silicon controlled rectifier defective.	*b.* Replace float switches (para 5-6—5-9). Replace pump prime switch or silicon controlled rectifier (para 5-2).
3. No response when master switch placed in start position.	Centrifugal switch assembly starter cutout switch defective.	Perform continuity check between pins A and B of centrifugal switch assembly electrical receptacle. If continuity is not indicated, repair or replace switch assembly (para 3-14).
4. Starter motor fails to operate.	*a.* Armature end play incorrect.	*a.* Adjust armature end play (para 3-6).
	b. Brush connection defective.	*b.* Repair brush connection (para 3-6).
	c. Ring assembly defective.	*c.* Replace ring assembly (para 3-6).
	d. Motor armature assembly open.	*d.* Resolder commutator or replace motor armature assembly (para 3-6).
	e. Bearing defective	*e.* Replace defective bearing (para 3-6).
	f. Interference between motor armature assembly and field coil assembly.	*f.* Check and correct dimensions (para 3-7).
5. Starter motor rotates only until master switch is released from start position.	*a.* Master relay (K2) defective.	*a.* Check for voltage between terminal 2 on rear of remote-local voltage sensing selector switch and generator set ground with master switch in RUN position. If no voltage is present replace K2 (para 4-12).

Chart 2-1. Troubleshooting —Continued

Malfunction	Probable Cause	Corrective Action
5. Starter motor rotates only until master switch is released from start position-continued	*b*. No. 1 holding relay (K3) defective	*b*. Perform test procedure (para 2-5). If malfunction is indicated, replace relay (para 4-12).
	c. Centrifugal switch assembly defective	*c*. Perform continuity check between pins in centrifugal switch assembly electrical receptacle. Pin A to B should indicate continuity. Pin C to D should indicate continuity. Pin D to E should indicate continuity. Pin D to F should indicate no continuity. If malfunction is indicated, repair or replace centrifugal switch assembly (para 3-14).
6. Starter Motor rotates in wrong direction	Starter Motor wired incorrectly	Correct wiring (para 3-6).
7. Starter Motor operates at less than required speed	*a*. Brushes not fully seated	*a*. Run in until at least 80 percent contact is obtained (para 3-6).
	b. Armature end play incorrect	*b*. Adjust armature end play (para 3-6).
	c. Rough finish on armature commutator.	*c*. Machine commutator (para 3-6).
	d. Commutator bars or motor armature windings shorted	*d*. Undercut commutator or replace motor armature assembly (para 3-6).
	e. Interference between motor armature assembly and field poles	*e*. Replace defective parts (para 3-6).
	f. Bearing defective	*f*. Replace bearing (para 3-6).
	g. Field assembly windings shorted.	*g*. Replace field assembly (para 3-6).
8. Starter motor rotates but does not crank engine.	*a*. Starter clutch defective	*a*. Adjust, repair, or replace starter clutch (para 3-6).
	b. Accessory drive assembly or engine coupling shafts defective	*b*. Check for positive coupling through engine by manually turning wheel. Replace defective components.
9. Starter motor current too high	*a*. Motor armature assembly shorted or grounded.	*a*. Check for short; repair or replace motor armature assembly (para 3-6).
	b. Field assembly shorted or grounded	*b*. Replace field assembly (para 3-6).
	c. Motor armature assembly shorted to field assembly	*c*. Clear short or replace defective part (para 3-6).
10. Combustion does not occur or combustion occurs but engine will not accelerate	*a*. Main fuel pump defective.	*a*. Perform test procedure (para 5-11). If malfunction is indicated, repair or replace main fuel pump assembly (para 5-11).
	b. Oil pressure sequencing switch defective	*b*. Adjust or replace oil pressure sequencing switch (para 3-12).
	c. Oil pump assembly defective	*c*. Repair or replace oil pump assembly (para 3-16).
	d. Leakage in control air tubing assemblies to fuel control unit	*d*. Check all tubing assemblies for leaks. Tighten any loose connections and replace, any defective tubing assemblies.
	e. Leakage in acceleration and overtemperature control thermostat	*e*. Energize protection by-pass switch on electrical controls instruments panel and start generator set. If combustion occurs, shut down generator set deenergize protection bypass switch, and replace defective thermostat (para 3-17).
	f. Fuel control unit defective.	*f*. Repair or replace fuel control unit (para 3-7).

Chart 2-1. Troubleshooting—Continued

Malfunction	Probable Cause	Corrective Action
11. Engine stops immediately after combustion occurs	*a.* Holding relays (K3 or K4) defective.	*a.* Perform test procedure (para 2-5). If malfunction is indicated, replace holding relays (para 4-12).
	b. Oil pressure sequencing switch defective.	*b.* Perform test procedure (para 2-5). If malfunction is indicated, adjust or replace oil pressure sequencing switch (para 3-12).
	c. Oil pump assembly defective.	*c.* Repair or replace oil pump assembly (para 3-16).
	d. Fuel control unit defective.	*d.* Repair or replace fuel control unit (para 3-7).
12. Starter motor fails to shut off when engine RPM increases to approximately 35 percent of governed speed.	Centrifugal switch assembly defective.	Repair or replace centrifugal switch assembly (para 3-14).
13. Engine starts, accelerates to governed speed or less, and shuts down.	*a.* Centrifugal switch assembly overspeed shut down switch setting too low or defective.	*a.* Adjust overspeed shutdown switch (para 3-14). Repair or replace centrifugal switch assembly (para 3-14).
	b. Low oil pressure switch defective.	*b.* Adjust or replace low oil pressure switch (para 3-11).
14. Engine does not reach governed speed, or the rate of acceleration too slow.	*a.* Acceleration and over-temperature control thermostat defective.	*a.* Adjust, repair, or replace thermostat (para 3-17).
	b. Turbine wheel and nozzle dirty.	*b.* Clean turbine wheel and nozzle (para 3-21).
	c. Fuel control unit defective.	*c.* Repair or replace fuel control unit (para 3-7).
15. Acceleration erratic.	*a.* Acceleration and over-temperature control thermostat defective.	*a.* Adjust, repair, or replace thermostat (para 3-17).
	b. Fuel control unit defective.	*b.* Repair or replace fuel control unit (para 3-7).
16. Acceleration too fast.	*a.* Acceleration and overtemperature control thermostat defective.	*a.* Adjust, repair, or replace thermostat (para 3-17).
	b. Fuel control unit defective.	*b.* Repair or replace fuel control unit (para 3-7).
17. Excessive exhaust gas temperature on start, or flaming start.	*a.* Turbine plenum drain obstructed.	*a.* Remove obstruction from turbine plenum drain
	b. Acceleration and overtemperature control thermostat defective.	*b.* Adjust, repair, or replace thermostat (para 3-17).
	c. Fuel atomizer assembly defective.	*c.* Repair or replace fuel atomizer assembly (para 3-21).
	d. Turbine wheel and nozzle dirty.	*d.* Clean turbine wheel and nozzle (para 3-21).
	e. Fuel control unit defective.	*e.* Repair or replace fuel control unit (para 3-7).
18. Engine goes to overspeed on acceleration.	Defective fuel control unit.	Repair or replace fuel control unit (para 3-7).
19. Low oil pressure or loss of oil pressure during operation.	Oil pump assembly defective.	Repair or replace oil pump assembly (para 3-16).
20. Engine shuts down during operation.	*a.* Main fuel pump and motor assembly defective.	*a.* Repair or replace main fuel pump and motor assembly (para 5-11).
	b. Oil pump assembly defective.	*b.* Repair or replace oil pump assembly (para 3-16).
	c. Low oil pressure switch defective.	*c.* Replace low oil pressure switch (para 3-11).
	d. Centrifugal switch assembly defective.	*d.* Perform continuity check between pins in centrifugal switch assembly electrical receptacle Pin A to B should indicate continuity. Pin C to D should indicate continuity.

Chart 2-1. Troubleshooting—Continued

Malfunction	Probable Cause	Corrective Action
20. Engine shuts down during operation—continued		*d.* Pin D to E should indicate continuity. Pin D to F should indicate no continuity. If malfunction is indicated, repair or replace centrifugal switch assembly (para 3-14).
	e. Fuel control unit defective.	*e.* Repair or replace fuel control unit (para 3-7).
21. Random frequency fluctuates at no load	Restrictions in fuel inlet hose assemblies to fuel control unit or main fuel pump output inadequate	Check fuel hose assemblies for restrictions. Replace hose assemblies as required. Check main fuel pump output (para 5-11). Replace main fuel pump as required. (para 5-11).
22. Frequency has periodic cyclic tendency at no load, some times stabilizing with application of load.	Leakage around plate valve orifice	Remove fuel control unit from engine (para 3-7) and replace unit.
23. No AC Generator output overvoltage light is off.	*a.* No 2 holding relay (K4) defective.	*a.* Replace relay (K4) (para 4-12).
	b. AC generator control relay (K12) defective.	*b.* Replace relay (K12) (para 4-12).
24. No AC generator output, overvoltage 1 light is on.	Overvoltage relay (K10) defective.	Replace relay (K10) (para 4-12).
25. AC voltage cannot be adjusted.	Voltage adjusting rheostat defective.	Replace voltage adjusting rheostat (para 4-11).
26. AC generator trips off and cycles when circuit breaker switch is held closed.	*a.* Overvoltage relay (K5) defective.	*a.* Replace overvoltage relay (K5) (para 4-12).
	b. Overcurrent relay (K14) defective	*b.* Replace overcurrent relay (K14) (para 4-12).
	c. Undervoltage relay (K11) defective.	*c.* Replace undervoltage relay (K11) (para 4-12).
	d. Centrifugal switch assembly defective	*d.* Repair or replace centrifugal switch assembly (para 3-14).
27. Engine speed droops on application of load	*a.* Leakage in control air tubing assemblies to fuel control unit.	*a.* Check all tubing assemblies for leaks. Tighten any loose connections and replace any defective tubing assemblies.
	b. Leakage in acceleration and overtemperature control thermostat.	*b.* Energize protection bypass switch on electrical controls instruments panel. If condition is corrected, shutdown generator set and replace defective thermostat (para 3-17).
	c. Turbine wheel and nozzle dirty.	*c.* Clean turbine wheel and nozzle (para 3-21).
28. Voltage droop cannot be adjusted	*a.* Frequency or voltage droop potentiometers defective	*a.* Replace potentiometers (para 4-12).
	b. Current transformer (CT4) defective.	*b.* Replace transformer (CT4) (para 4-8).
29. Frequency droop cannot be adjusted.	*a.* Frequency droop potentiometer defective	*a.* Replace frequency droop potentiometer (para 4-12).
	b. Current transformer (CT1) through (CT3) defective.	*b.* If malfunction is indicated, replace current transformers (CT1 through CT3) (para 4-8).
	c. Load anticipator defective.	*c.* Perform test procedure. If malfunction is indicated, replace load anticipator (para 4-6).
	d. Fuel control unit defective	*d.* Repair or replace fuel control unit (para 3-7).
30. Battery heater does not operate.	*a.* Battery temperature sensor relay (K15) defective.	*a.* Replace battery temperature sensor relay (K15) (para 4-12).
	b. Temperature control relay (K9) defective	*b.* Replace temperature control relay (K9) (para 4-12).
31. Battery heater fan operates but heater does not ignite	Heater igniter defective	Replace heater igniter (para 6-3).

Chart 2-1. Troubleshooting—Continued

Malfunction	Probable Cause	Corrective Action
32. Battery heater fan operates when switch is off.	NOTE Fan will normally operate for a short period after heater is shut off until flame switch cools and actuates. Wiring defective.	Replace defective wiring (para 6-3).
33. AC Generator voltage will not build up.	*a.* Open connection between ac generator PMG and voltage regulator	*a.* Check for open connection and repair connection as required.
	b. Open connections between ac generator exciter field and voltage regulator.	*b.* Check for open connection and repair connection as required.
	c. Open ac generator exciter field	*c.* Repair if external, replace wound frame if internal (para 4-1).
	d. Open ac rotor field in ac generator	*d.* Replace armature and rotor assembly (para 4-1).
	e. Shorted armature	*e.* Replace armature and rotor assembly (para 4-1).
34. AC generator output voltage low.	*a.* Voltage regulator voltage adjust resistor setting incorrect.	*a.* Adjust voltage adjust resistor (para 4-2).
	b. Voltage regulator resistor R2 shorted.	*b.* Replace resistor R2 (para 4-2).
	c. Voltage regulator Zener Diode defective.	*c.* Replace Zener Diode (para 4-2).
	d. Voltage regulator resistor R6, open.	*d.* Replace resistor R6 (para 4-2).
	e. Voltage regulator transistor defective.	*e.* Replace transistor (para (6-2).
	f. Shorted or open cell in voltage regulator rectifier CR2.	*f.* Replace rectifier CR2 (para 4-2).
	g. Shorted voltage regulator capacitor C1 or C5.	*g.* Replace capacitor C1 or C5 as required (para 4-2).
	h. Low ac generator PMG voltage.	*h.* PMG output voltage should be about 140 volts rms at 1200 cps with PMG connected to control panel. Replace defective components as required (para 4-1).
	i. Shorted voltage regulator voltage reference CR3.	*i.* Voltage drop across CR3 should be 11.12 to 12.28 volts with 7.5 milliamperes through it. If shorted, replace CR3 (para 4-2).
	j. Open or short circuited ac generator rectifiers.	*j.* Test for open or short circuited rectifiers. If open or short circuit is indicated, replace rectifiers (para 4-1).
	k. Short circuited ac generator exciter field or ac stator winding.	*k.* Replace defective part (para 4-1).
35. AC generator output voltage high.	*a.* Excessive ac generator PMG voltage	*a.* PMG output voltage should be about 140 volts rms at 1200 cps with PMG connected to control panel. Replace defective components as required (para 4-1).
	b. Voltage regulator voltage adjust resistor setting incorrect	*b.* Adjust voltage adjust resistor (para 4-2).
	c. Voltage regulator resistors R2, R3, or R5 open.	*c.* Replace open resistors (para 4-2).
	d. Voltage regulator reactor L2 open.	*d.* Replace reactor L2 (para 4-2).
	e. Open or shorted cell in voltage regulator rectifier CR1.	*e.* Check for 123 ± 4 percent volts between circuit point 12 and 13. If malfunction is indicated, replace rectifier CR1 (para 4-2).
	f. Open winding in v voltage regulator transformer T1.	*f.* Check for 123 ± 4 percent volts between circuit point 12 and 13. If malfunction is indicated, replace transformer T1 (para 4-2).

Chart 2-1. Troubleshooting—Continued

Malfunction	Probable Cause	Corrective Action
35. AC generator output voltage high—Continued	*g.* Open voltage regulator voltage reference rectifier CR3	*g.* Voltage drop across rectifier CR3 should be 11.12 to 12.28 volts with 7.5 milliamperes through it. Replace rectifier CR3 if required (para 4-2).
36. Unstable AC generator operation	*a.* Voltage regulator reactor L2, capacitors C1, C2, C3, C4, C5 or resis R9 R10 defective.	*a.* Replace defective component (para 4-2).
37. AC generator exciter field current high.	*a.* Open or short circuited ac generator rectifiers.	*a.* Test for open or short circuited rectifiers. If open or short circuits is indicated, replace rectifiers (para 4-1).
	b. Shorted turns in ac generator armature and rotor assembly.	*b.* Replace armature and rotor assembly (Para 4-1).
38. AC generator overheating.	*a.* Internal shorts or grounds.	*a.* Perform electrical inspection check. Repair or replace defective parts (para 4-1).
	b. Obstruction in cooling air ducts.	*b.* Remove obstruction.
	c. Cooling air fan failed.	*c.* Repair or replace cooling air fan (para 4-1).

Section III. GENERAL MAINTENANCE

2-7. Generator Set Test Instructions

a. General. Testing of the generator set consists basically of operating the equipment under various conditions and monitoring the operation with appropriate test instrumentation to insure that the generator set is capable of operation within its design limits. Reference should be made to TM 5-6115-339-12 for operating instructions and for identification, location, and function of various controls and instruments associated with the generator set.

b. Precautionary Requirements. Observe the following precautions during testing.

(1) If rework involving oil pump or any extensive rework of the engine has occurred that may contaminate the oil supply with metal chips or similar refuse, install a screen over the end of oil jet tube and attach a tag to unit indicating installation of screen. Operate generator set for a minimum of ten minutes at governed speed, then remove screen.

(2) Shutdown generator set immediately if any of the operating limits specified in table 2-3 are exceeded. Determine the cause and correct the malfunction before proceeding with test procedures.

c. Fuel System Check. Connect an external fuel source (approximately 50 gallons) to the fuel inlet fitting and observe the following fuel system functions.

(1) After five or six hours of running the external fuel source should be empty. Note that the fuel tank auxiliary fuel pump shuts down and the low fuel warning light comes on.

(2) Add a small quantity of fuel to the external fuel source and actuate the PUMP PRIME SWITCH until the auxiliary fuel pump continues to operate and the low fuel warning light goes out.

(3) Change the FUEL SELECTOR VALVE to NORMAL position.

(4) Disconnect the external fuel hose and cap the fuel inlet fitting.

d. Winterization Equipment Test. Disconnect electrical connector to battery electrolyte temperature sensor and install jumper wires between pins 1 and 3 and pins 2 and 4 of the connector. Remove cap from battery heater exhaust. Perform test as follows:

(1) Place generator set HEATER switch in the ON position and observe that the battery heater starts and operates satisfactorily.

(2) With the heater operating, partially block off the heater fresh air outlet duct to cause an overheat condition in the heater. Observe that the overheat switch shuts down the heater.

Table 2-3. Generator set test operating limits

Condition	Limit	Tolerance	Remarks
Fuel leakage.	One drop per minute	Maximum	From FUEL SCHEDULE VENT fitting only. Fuel leakage from the plenum drain is permitted only after a false start or flameout.
Time to combustion	5 seconds	Maximum	Starting after 5psig oil pressure is attained.
Starter motor duty cycle	One minute of continuous cranking or five consecutive starts in 10 minutes	Maximum	Allow starter to cool before repeating duty cycle.
Inlet air temperature	130° F.	Maximum	
Oil temperature	Must not exceed 115° F above inlet air temperature to cooling fan.	Maximum	
Turbine discharge temperature	1350° F	Absolute maximum	**Caution: This temperature must not be exceeded at any time under any operating conditions.**
Turbine discharge temperature	1310° F	Maximum	Maximum allowable temperature for continuous operation.
Turbine wheel speed	43,656 rpm	Absolute maximum	**Caution: This turbine wheel speed must not be exceeded at any time under any operating conditions.**
Turbine wheel speed	40,800 rpm	Nominal	Nominal allowable speed for continuous operation at no load.
Turbine wheel speed variation	±100 rpm	Maximum	At steady state operating conditions.
Vibration	0.6 mil	Maximum	At steady state operating conditions at turbine wheel speeds from 40,000 to 43,656 rpm only. Note. Maximum peak vibration greater than 0.6 mil may occur at certain critical turbine wheel speeds from 15,000 rpm to 32,000 rpm. **Caution: Do not operate the generator set continuously at any speed where the vibration exceeds 0.6 mil.**

NOTE

The heater blower should continue to run, after overheat switch actuates until heater has cooled sufficiently for the overheat switch to open.

2-8. General Cleaning Instructions

a. Metal Parts.

(1) Prior to removal or disassembly of major components, clean off excess oil or dirt with cleaning solvent Federal Specification P-D-680 or steam clean.

(2) Use cleaning solvent to clean parts such as gears, housing and hard packed bearings.

CAUTION

Do not immerse oil impregnated bearings, or sealed bearings in cleaning solvent, clean with a solvent moistened cloth.

(3) Use a soft bristle brush to clean irregular shaped surfaces; use wooden pegs to clean ports and orifices. Use a lint free cloth to wipe parts clean.

(4) Exercise care when handling machined and polished surfaces to avoid nicks and other damage. Do not immerse more than one metal machined part in solvent at the same time unless such parts are separated or protected from contacting each other.

b. Electrical Components.

(1) Prior to removal or disassembly of electrical components, clean exterior by scraping off excess oil and dirt. Wipe clean with a lint free cloth dampened with cleaning solvent (Fed. Spec. P-D-680).

CAUTION

Do not immerse any electrical component or device in cleaning solvent.

(2) Clean armatures, coils and solenoids with filtered compressed air and wipe clean with a lint free cloth dampened in cleaning solvent.

(3) Wipe electrical terminals clean with a lint free cloth dampened in cleaning solvent. Use a soldering iron and a solder sipper to clean solder away from terminals and connectors.

c. Gaskets, Seals and O-Rings.

(1) Clean all old gasket particles from mating surface.

(2) Discard and replace all gasket, seals, O-rings and felt washers.

2-9. General Inspection Instructions

a. General. Perform an inspection of all parts as soon as possible after cleaning. Instructions for specific inspection procedures are included in the text at the point where the inspection must be performed.

b. Visual Inspection.

(1) Visually inspect all machined and polished areas. Use a strong light, to shine across polished surfaces to inspect for scoring, cracks, breaks or excessive wear.

(2) Visually inspect all gears, for evidence of metal to metal abrasion, pitting, cracks, chipped or broken teeth or excessive wear.

c. Electrical Parts.

(1) Visually inspect wiring harness and wiring for frayed edges or damaged insulation.

(2) Inspect all electrical parts such as solenoids, with power applied to observe actual operation.

2-10. General Repair Instructions

a. Thread Repair. Use proper size tapping tool to repair tapped holes. Discard and replace all hardware that has defective threads.

b. Press Fit Parts.

(1) Gears and bearings may require the use of a pneumatic or hand operated arbor press.

(2) Preheat all press-fit parts before reassembly if specified. Use a lubricant if necessary to reduce abrasive action.

CAUTION

Do not press on the outer race of bearings when installing on shafts. Do not press on inner race of bearings when installing in a housing.

Section IV. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS

2-11. General

a. The major components of the generator set are the gas turbine engine and the AC generator assembly. Removal of the engine is facilitated by removing the engine and generator assembled and separating the generator after removal from the enclosure.

b. Removal of the generator may be accomplished without removing the engine. Replacement or repair of certain components of the generator set will require a partial performance test as applicable and as described in paragraph 2-7.

2-12. Gas Turbine Engine

a. Removal. Remove the gas turbine engine with generator attached as described below while referring to figure 2-11.

(1) Remove top center panel assembly (1), aft top panel assembly (2), and support (3).

(2) Disconnect wiring harness connector (4) at generator. Remove screws (5), washers (6), and terminal board cover (7).

(3) Remove nuts (8), washers (9) and generator electrical leads (10).

(4) Remove nuts (11), washers (12), and starter electrical leads (13).

NOTE

Tag or otherwise identify starter electrical leads as removed to aid in installation.

(5) Disconnect engine control harness connector (14) at engine receptacle.

(6) Loosen clamp (15) and disconnect cooling air discharge duct hose (16).

(7) Remove screws (17) and lift out upper half of firewall assembly (18).

(8) Remove bolts (19), washers (20), exhaust muffler assembly (21), screws (28), and cover assembly (29). Loosen clamp (25), and remove exhaust assembly (27), clamp (25), and gasket (26). Disconnect turbine plenum drain tube assembly (30) at plenum drain fitting.

(9) Disconnect oil drain hose assembly (31) at tee fitting on oil drain valve.

(10) Disconnect governor trim control electrical connector (32), fuel hose assembly (33), and fuel control unit drain hose assembly (34) at fuel control unit (35).

(11) Disconnect engine oil hose assemblies (36, 37, 38) from oil manifold (39).

(12) Disconnect oil pump discharge hose assembly (40) at oil pump discharge port.

(13) Remove bolts (41) and washers (42) from engine stand assembly.

(14) Install beam type adjustable sling (1, fig. 2-12) on engine hoisting brackets and attach sling to hoist of 2000 pound capacity.

(15) Hoist gas turbine engine with attached generator and engine assembly.

(16) Remove ac generator as described in paragraph 2-12 and as shown in figure 2-12.

(17) If engine is to be disassembled, support engine with beam type adjustable sling and hoist. Remove nuts (17, fig. 2-12), washers (18), bolts (19, 20, 22), washers (21, 23), and engine stand assembly (24). Install engine in portable stand (3, fig. 2-13) using maintenance stand adapters (4, 5). Remove beam type adjustable sling (1).

b. Installation. Install gas turbine engine in reverse order of removal procedure using figure 2-11 as a guide. Perform generator set test procedures described in paragraph 2-7 after engine installation.

Key to figure 2-11 (1):

1. Top center panel assembly
2. Aft top panel assembly
3. Support
4. Wiring harness connector
5. Screw (4)
6. Washer (4)
7. Terminal board cover
8. Nut (12)
9. Washer (12)
10. Electrical lead (10)
11. Nut (2)
12. Washer (2)
13. Electrical lead (4)
14. Wiring harness connector
15. Clamp
16. Cooling air discharge duct hose
17. Screw (8)
18. Upper half firewall assembly

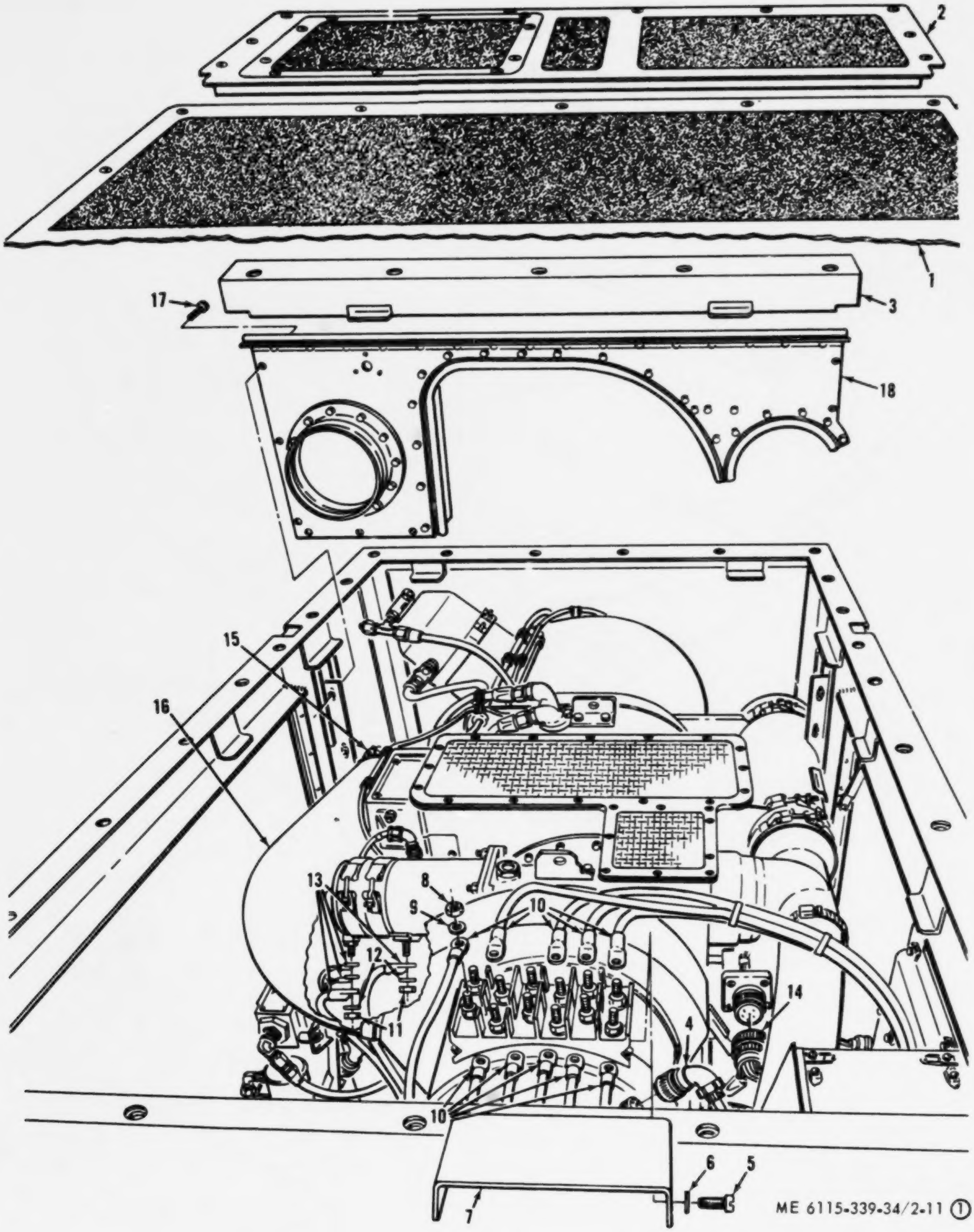
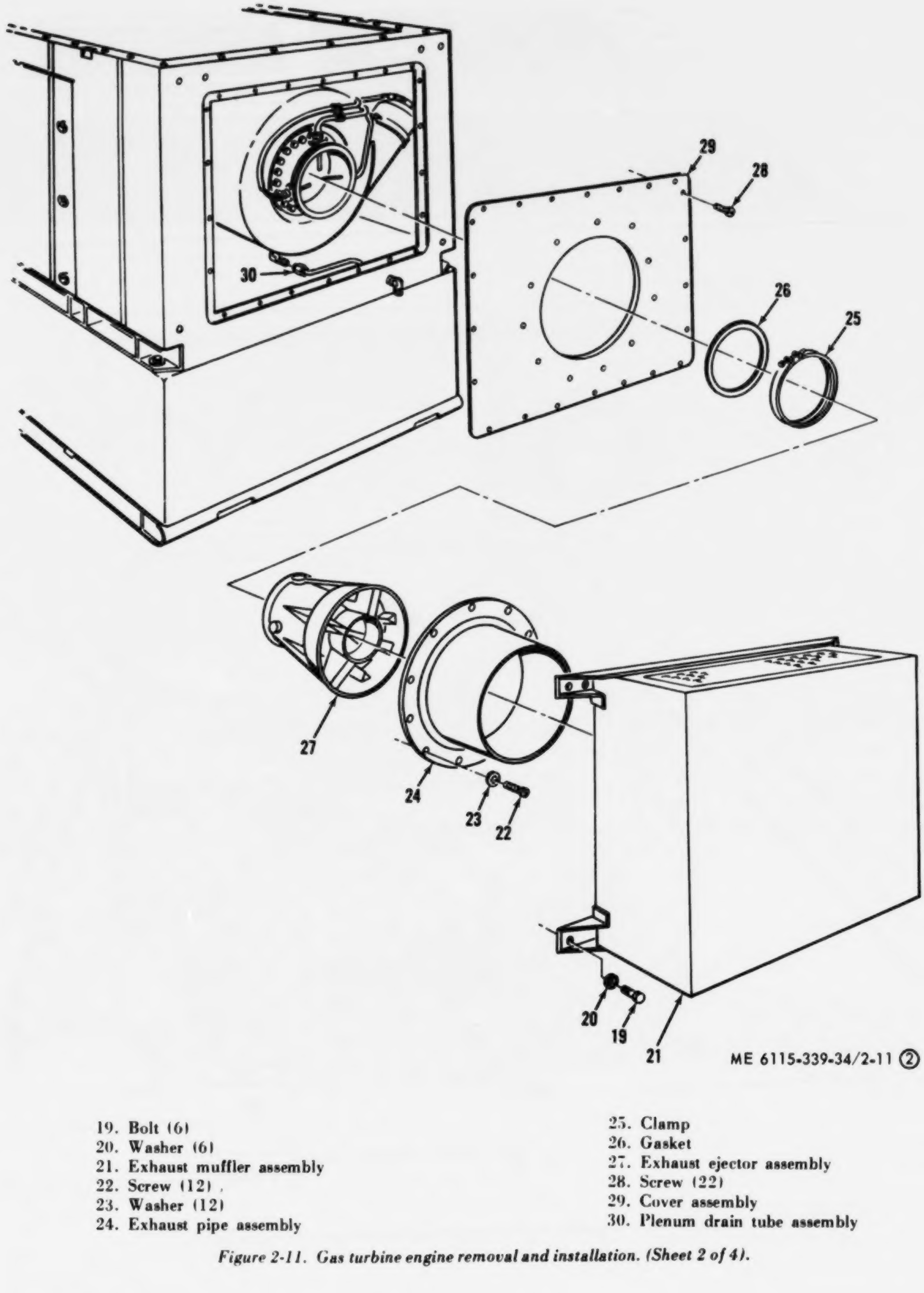
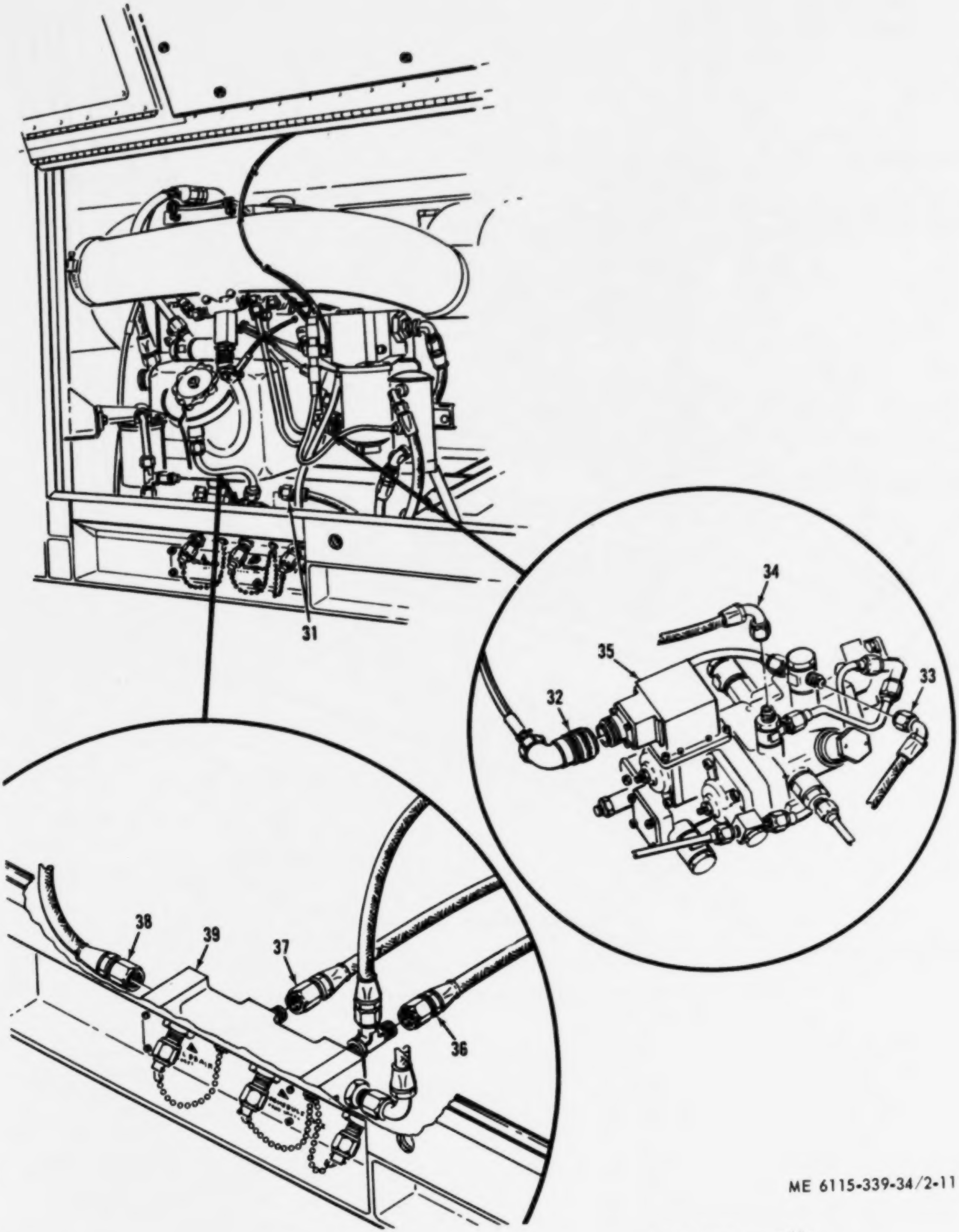


Figure 2-11. Gas turbine engine removal and installation (Sheet 1 of 4).



19. Bolt (6)
20. Washer (6)
21. Exhaust muffler assembly
22. Screw (12)
23. Washer (12)
24. Exhaust pipe assembly
25. Clamp
26. Gasket
27. Exhaust ejector assembly
28. Screw (22)
29. Cover assembly
30. Plenum drain tube assembly

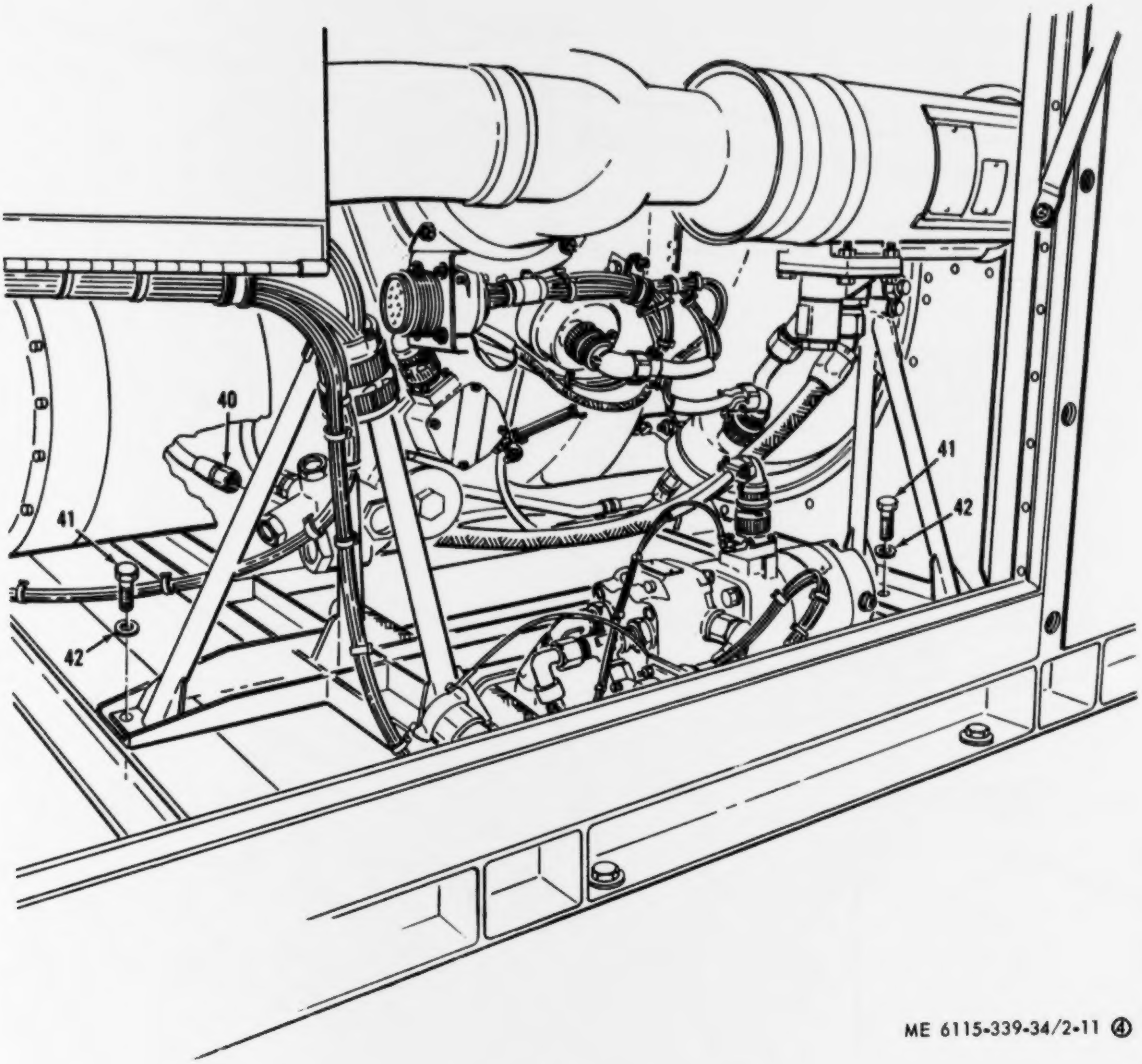
Figure 2-11. Gas turbine engine removal and installation. (Sheet 2 of 4).



ME 6115-339-34/2-11 ③

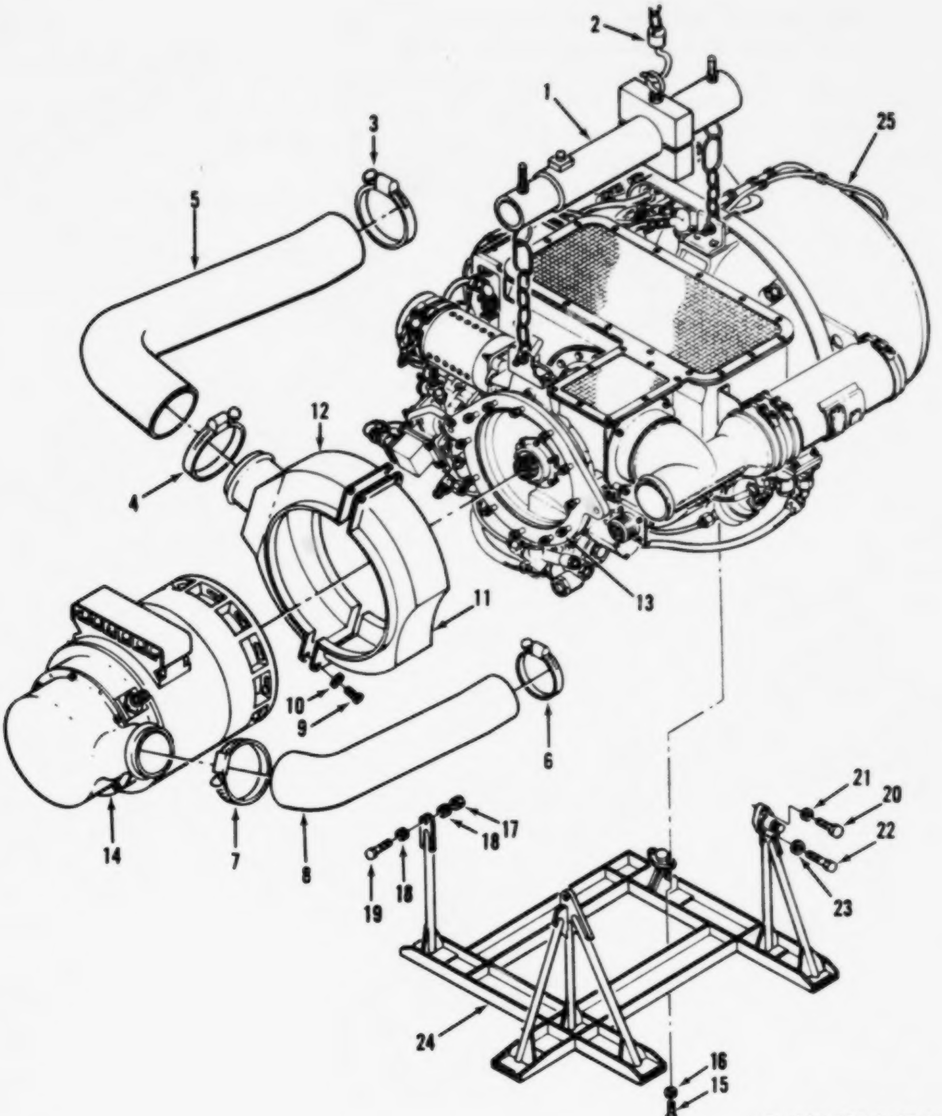
31. Oil drain hose assembly
32. Governor trim control electrical connector
33. Fuel hose assembly
34. Fuel drain hose assembly
35. Fuel control unit
36. Oil hose assembly
37. Oil hose assembly
38. Oil hose assembly
39. Oil manifold

Figure 2-11. Gas turbine engine removal and installation. (Sheet 3 of 4).



40. Oil pump discharge hose assembly
41. Bolt (14)
42. Washer (14)

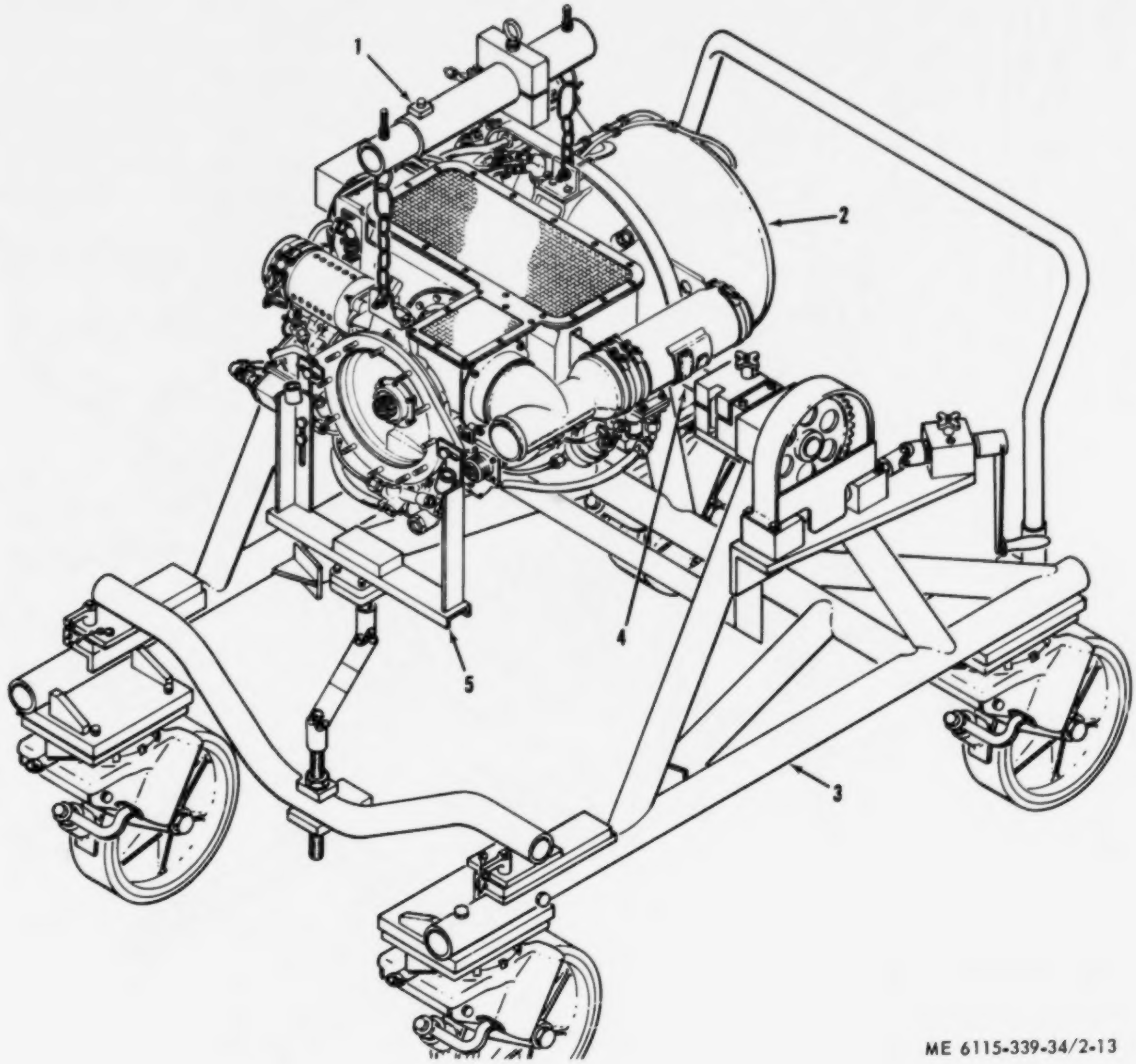
Figure 2-11. Gas turbine engine removal and installation. (Sheet 4 of 4).



ME 6115-339-34/2-12

1. Beam type adjustable sling
2. Hoist
3. Clamp
4. Clamp
5. Cooling air discharge duct hose
6. Clamp
7. Clamp
8. Cooling air inlet duct hose
9. Screw (4)
10. Washer (4)
11. Exhaust chamber shell
12. Exhaust chamber shell
13. Nut (12)
14. Generator
15. Bolt (2)
16. Washer (2)
17. Nut (2)
18. Washer (4)
19. Bolt (2)
20. Bolt
21. Washer
22. Bolt
23. Washer
24. Stand
25. Turbine engine power unit

Figure 2-12. AC generator and engine stand assembly removal and installation.



1. Beam type adjustable sling
2. Gas turbine engine
3. Portable stand
4. Maintenance stand adapter
5. Maintenance stand adapter

Figure 2-13. Installation of gas turbine engine in portable stand.

2-13. AC Generator

a. Removal. Remove ac generator as described below.

(1) Disconnect generator control harness connector (4, fig. 2-11) at generator control receptacle.

(2) Remove clamps (3, 4, fig. 2-12) and air duct hose (5).

(3) Remove clamps (6, 7) and air duct hose (8).

(4) Remove screws (9), washers (10), and exhaust chamber shells (11, 12).

(5) Support generator (14) and loosen nuts (13). Rotate generator counterclockwise and remove from mounting pad.

b. Installation. Install ac generator in reverse order of removal using figures 2-11 and 2-12 as guides. Perform generator set test procedures described in paragraph 2-7 after generator installation.

2-14. Fuel Tank Assembly

a. Removal. Refer to figure 2-14 and remove the fuel tank as follows:

(1) Disconnect fuel tank assembly harness connector (1) at receptacle (2). Install internally wired plug (3) in receptacle (2).

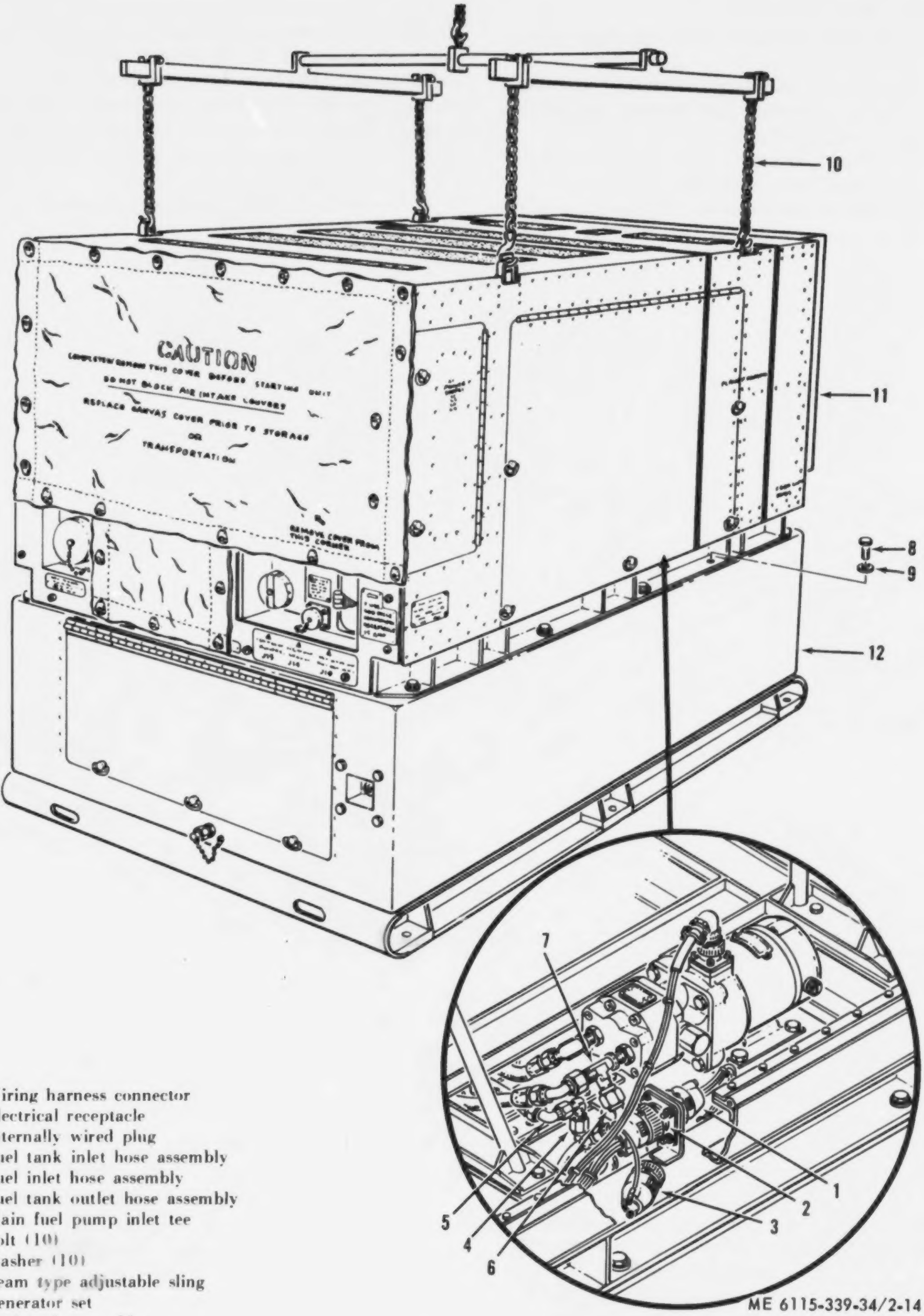
(2) Disconnect fuel tank inlet hose assembly (4) from fuel inlet hose assembly (5).

(3) Disconnect fuel tank outlet hose assembly (6) from main fuel pump inlet tee (7).

(4) Remove bolts (8) and washers (9).

(5) Use beam type adjustable sling (10) and an overhead hoist of 2000 pound capacity to lift generator set (11) from tank assembly (12). Guide wiring harness assembly and hose assemblies through opening in bottom of generator set inclosure to prevent binding during hoisting of generator set at fuel tank assembly.

b. Installation. Install fuel tank assembly in the reverse order of removal.


10
11
8
9
12
CAUTION
DO NOT BLOCK AIR INTAKE LOUVERS
REPLACE CANVAS COVER PRIOR TO STORAGE
OR
TRANSPORTATION
REMOVE COVER FROM THIS CORNER
7
5
4
6
3
2
1
ME 6115-339-34/2-14

1. Wiring harness connector
2. Electrical receptacle
3. Internally wired plug
4. Fuel tank inlet hose assembly
5. Fuel inlet hose assembly
6. Fuel tank outlet hose assembly
7. Main fuel pump inlet tee
8. Bolt (10)
9. Washer (10)
10. Beam type adjustable sling
11. Generator set
12. Fuel tank assembly

Figure 2-14. Fuel tank assembly removal and installation.

CHAPTER 3

REPAIR OF THE ENGINE

Section I. ENGINE WIRING AND PLUMBING

3-1. General

This section contains repair instructions for the engine wiring harness assembly, electrical lead assemblies, hose assemblies, tube assemblies, and plumbing fittings.

3-2. Gas Turbine Branched Wiring Harness Assembly

a. General. The wiring harness assembly is multiple lead harness with appropriate electrical connectors for interconnection of engine electrical components and control circuits.

b. Removal. Refer to figure 3-1 to remove the wiring harness assembly.

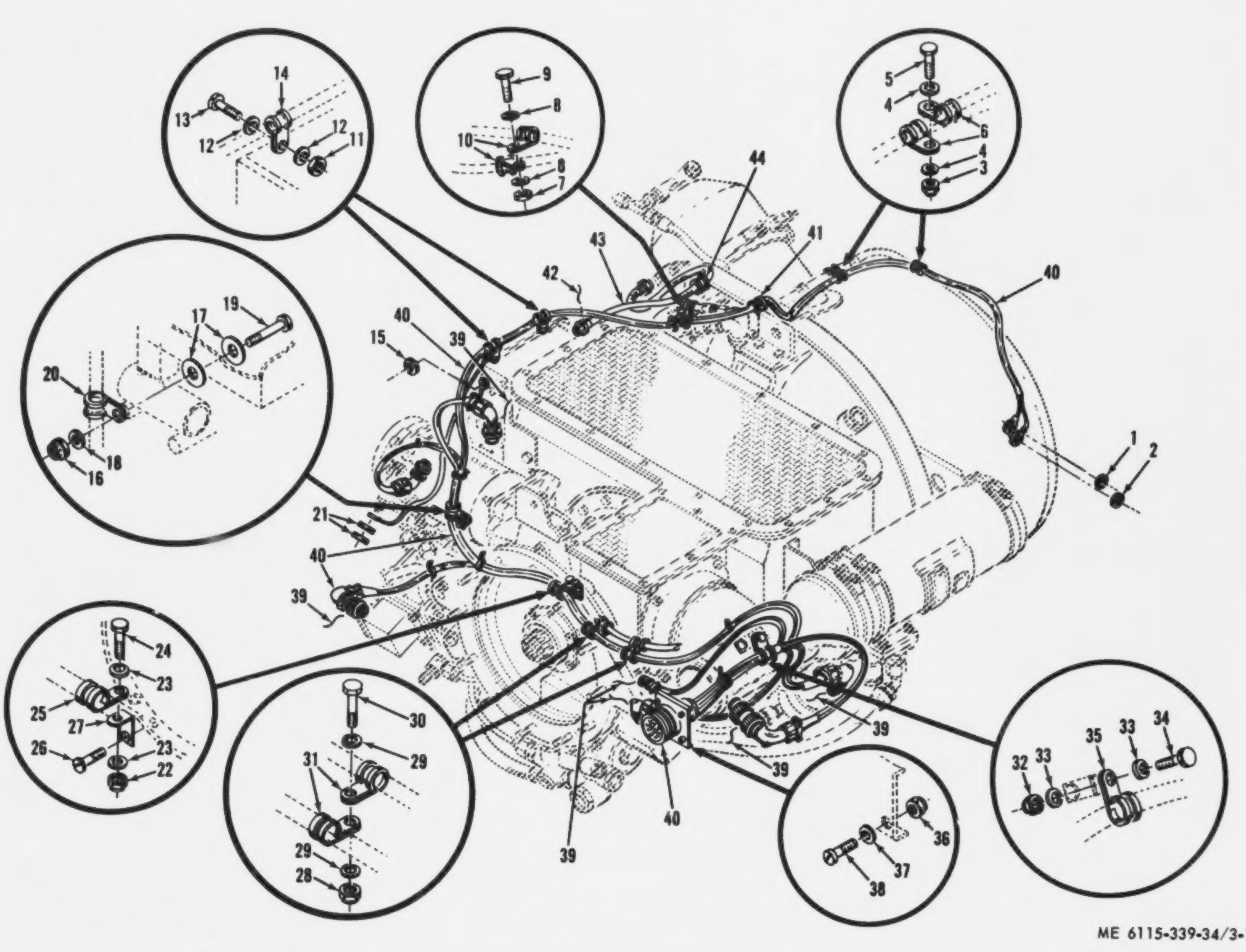
NOTE

Tag or otherwise identify electrical leads as they are removed to aid in installation.

c. Disassembly. Disassemble harness assembly only as required to replace defective components after inspection. Refer to figure 3-2 for location of components and to figure 3-3 for location of individual wires.

d. Reassembly. Assemble wiring harness in reverse order of disassembly.

e. Installation. Install wiring harness in reverse order of removal.



ME 6115-339-34/3-1

Figure 3-1. Engine branched wiring harness assembly and igniter plug electrical lead assembly, removal and installation.

Key to figure 3-1:

1. Nut
2. Nut
3. Nut (2)
4. Washer (4)
5. Bolt (2)
6. Clamp (4)
7. Nut
8. Washer (2)
9. Bolt
10. Clamp (2)
11. Nut (4)
12. Washer (4)
13. Screw (2)
14. Clamp (2)
15. Nut
16. Nut
17. Washer (2)
18. Washer (2)
19. Bolt
20. Clamp
21. Nut
22. Nut
23. Washer (2)
24. Bolt
25. Clamp
26. Screw
27. Bracket
28. Nut (2)
29. Washer (4)
30. Bolt (2)
31. Clamp (4)
32. Nut
33. Washer (2)
34. Bolt
35. Clamp
36. Nut (4)
37. Washer (4)
38. Screw (4)
39. Lockwire
40. Wiring harness assembly
41. Grommet
42. Lockwire
43. Igniter plug lead
44. Grommet

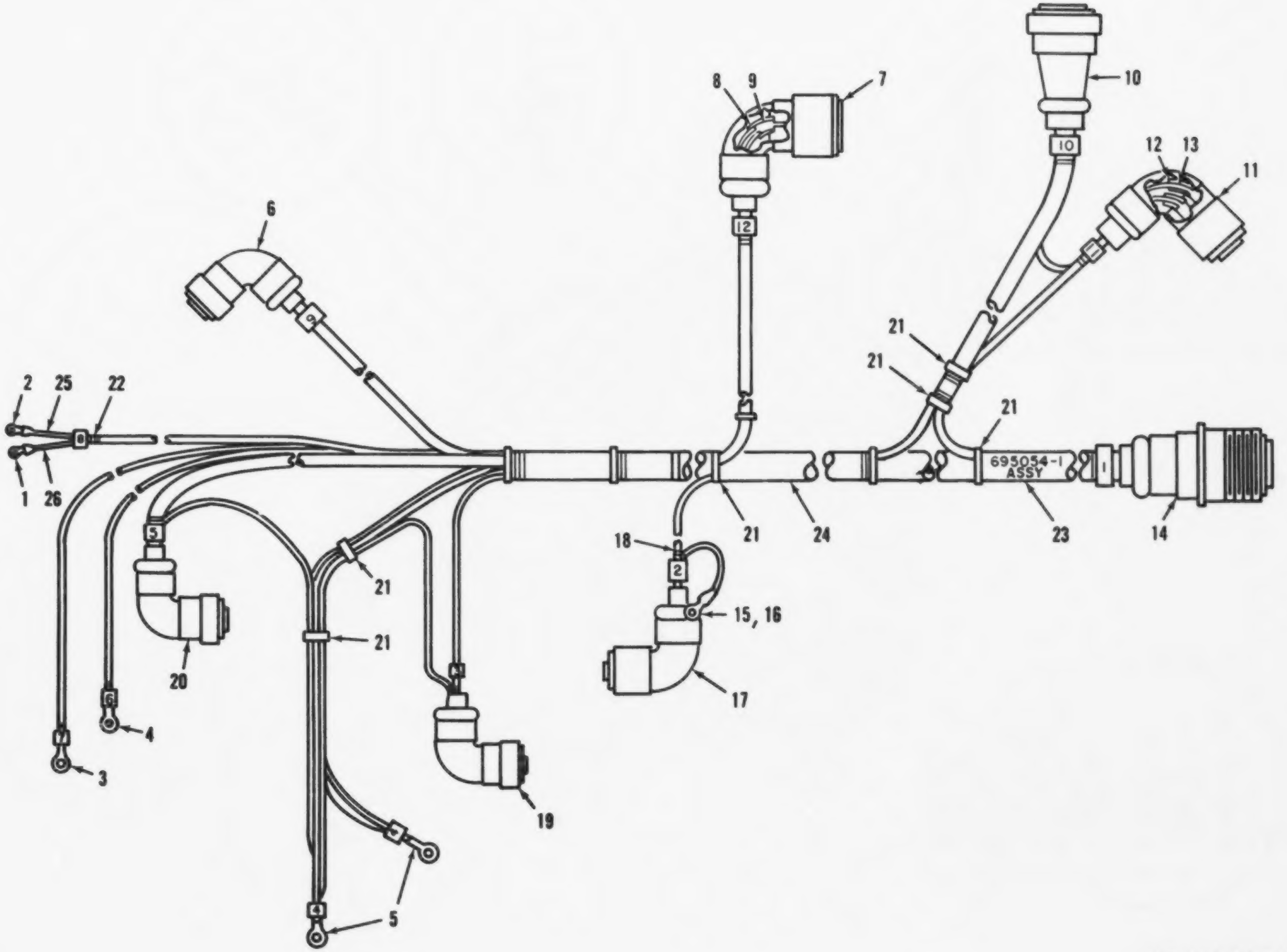
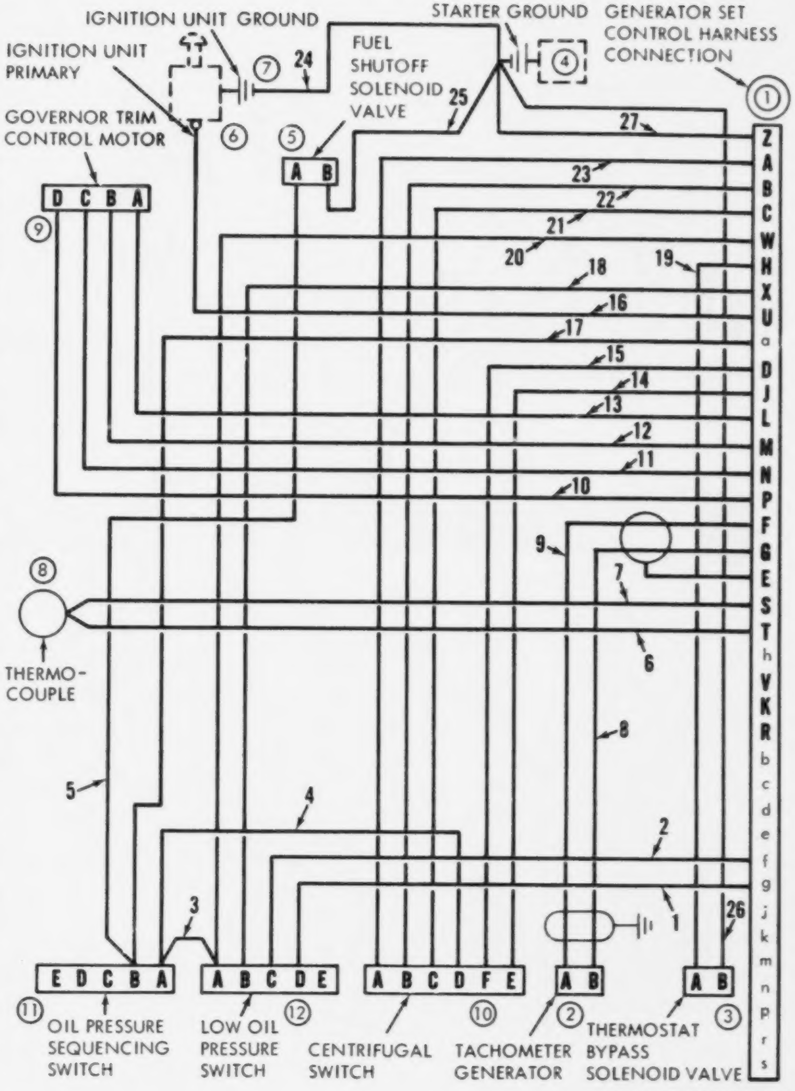


Figure 3-2. Engine branched wiring harness components.

Key to figure 3-2:

1. Terminal
2. Terminal
3. Terminal
4. Terminal
5. Terminal
6. Connector
7. Connector
8. Insulation sleeving (2)
9. Adapter
10. Connector
11. Connector
12. Insulation sleeving (2)
13. Adapter (2)
14. Connector
15. Terminal
16. Washer
17. Connector
18. Shielding, braided
19. Connector
20. Connector
21. Strap
22. Cord
23. Band marker
24. Wire
25. Wire
26. Wire

INDEX NO.	AWG SIZE	LENGTH INCHES	WIRE NO.	LOCATION NO.	PIN NO.	LOCATION NO.	PIN NO.
				FROM		TO	
1	18	18	E316A18	1	g	12	D
2	18	18	E315A18	1	f	12	C
3	18	19	K111B18	11	A	12	A
4	18	18"	K111C18	11	A	10	D
5	18	57"	K114B18	11	B	5	A
6	18	79"	ALUMEL	1	T	8	—
7	18	79"	CHROMEL	1	S	8	—
8	18	18-1/2"	E306A18	1	G	2	B
9	18	18-1/2"	E305A18	1	F	2	A
10	18	49-1/2"	K304A18	1	P	9	D
11	18	49-1/2"	K303A18	1	N	9	C
12	18	49-1/2"	K302A18	1	M	9	B
13	18	49-1/2"	K301A18	1	L	9	A
14	18	16-1/2"	K117A18	1	J	10	E
15	18	16-1/2"	K116A18	1	D	10	F
16	18	41-1/2"	K115A18	1	U	6	—
17	18	14"	K114A18	1	a	11	B
18	18	24"	K113A18	1	X	12	B
19	18	44"	K112A18	1	H	3	A
20	18	19"	K111A18	1	W	12	A
21	18	16-1/2"	K110A18	1	C	10	C
22	18	16-1/2"	K108A18	1	B	10	B
23	18	16-1/2"	K107A18	1	A	10	A
24	18	13-1/2"	K102D18N	7	—	4	—
25	18	13"	K102C18N	5	B	4	—
26	18	13-1/2"	K102B18N	3	B	4	-
27	18	45"	K102A18N	1	Z	4	—



ME 6115-339-34/3-3

Figure 3-3. Engine branched wiring harness wire identification.

3-3. Igniter Plug Electrical Lead Assembly

a. General. The igniter plug electrical lead assembly provides a shielded electrical connection between the ignition unit and the igniter plug. The lead assembly consists of a high tension electrical lead covered with a metal braid and with connectors compatible with the ignition unit and igniter plug.

b. Removal. Remove igniter plug electrical lead assembly (43, fig. 3-1) by removing lockwire (42) and disconnecting lead assembly at ignition unit and igniter plug.

c. Cleaning, Inspection, and Repair.

(1) Clean igniter plug electrical lead assembly with a lint free cloth or a soft bristle brush.

(2) Visually inspect lead assembly for damage to the metal braid or connectors. If damaged, replace lead assembly.

(3) Use a multimeter to check for continuity between the connector terminals and between the terminals and metal braid covering. If there is no continuity between terminals or if there is continuity between terminals and metal braid covering, replace lead assembly.

d. Installation. Install igniter plug electrical lead assembly in reverse order of removal. Lockwire connectors after installation.

3-4. Hose and Tube Assemblies and Plumbing Fittings

a. General. The hose and tube assemblies and plumbing fittings provide interconnection of pneumatic, fuel, and oil system components. Support clamps hold the hose and tube assemblies in place. The hose assemblies consist of metallic braid protected hoses with appropriate end fittings permanently secured to the hose and metallic braid. The tube assemblies consists of formed metal tubes with standard fittings to provide orientation and adaptation of hose and tube assemblies to the components.

b. Removal. Remove hose and tube assemblies and plumbing fittings according to sequence of index numbers assigned to figure 3-4.

NOTE

Make certain oil tank is drained prior to removing any hose or tubing assembly associated with the lubrication system. Tag or otherwise identify hose or tube assembly connection points.

c. Cleaning, Inspection, and Repair.

(1) Clean hose and tube assemblies and plumbing fittings with an approved cleaning solvent and dry thoroughly with filtered compressed air.

(2) Inspect all threaded parts for stripped, crossed, or peened threads. If threads are damaged beyond simple repair, replace the part.

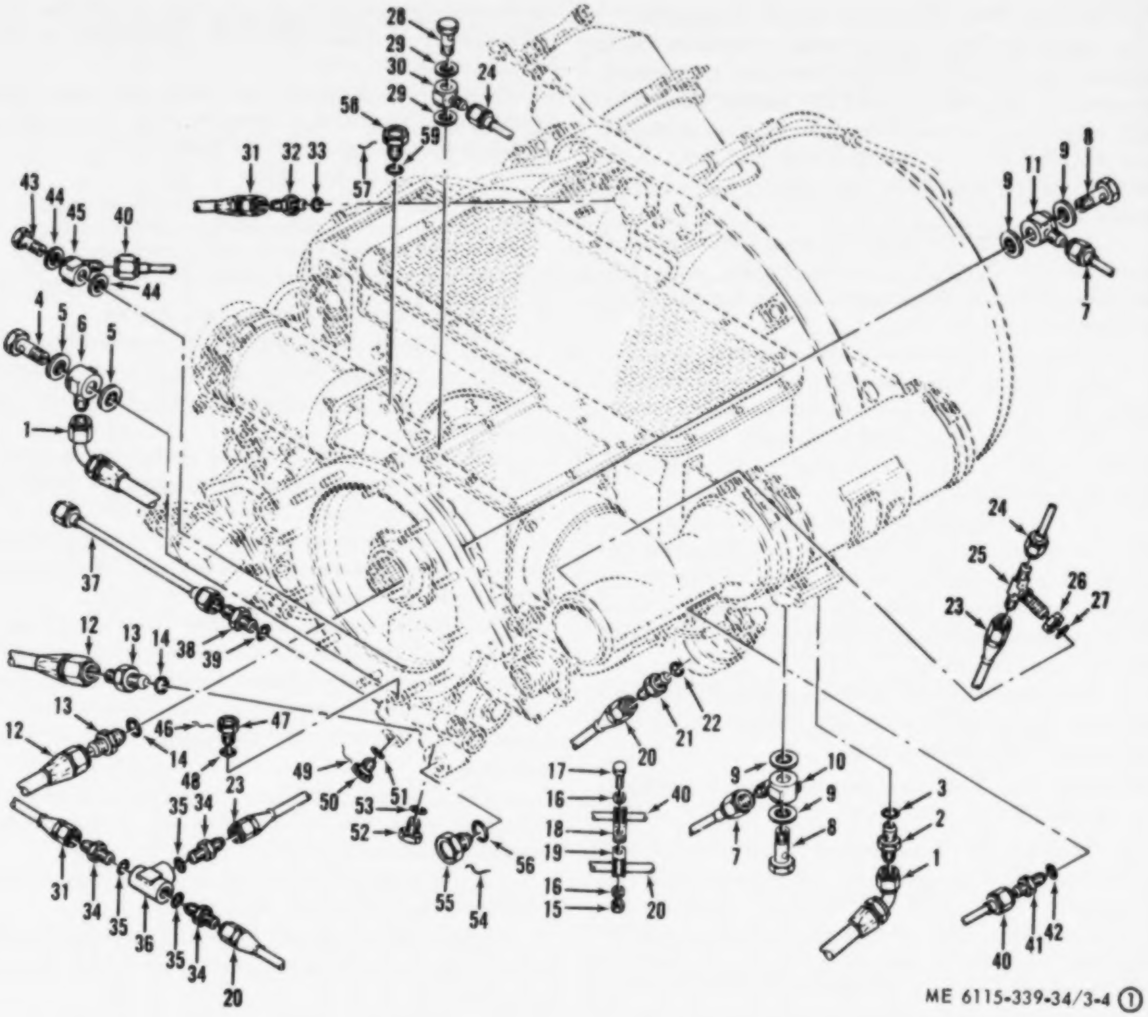
(3) Inspect hose assemblies for cracks, breaks, chafing, and damage to hose interior. If damaged, replace hose assembly.

(4) Inspect tube assembly for kinks, bends, cracks, or other damage which might restrict flow or result in leakage. Inspect connection nuts and sleeves on tube assemblies for loose sleeves or damage to nuts. If damaged, replace tube assembly.

(5) Inspect plumbing fittings for cracks and clogged passages. Clean clogged passages and replace cracked fittings.

(6) Replace all gaskets and packings at each overhaul regardless of condition.

d. Installation. Install hose and tube assemblies and plumbing fittings in reverse order of removal procedures.



ME 6115-339-34/3-4 ①

1. Hose assembly
2. Union
3. Gasket
4. Bolt
5. Packing (with retainer)
6. Elbow
7. Tube assembly
8. Bolt (2)
9. Packing (with retainer (2))
10. Elbow
11. Elbow
12. Hose assembly
13. Union (2)
14. Gasket (2)
15. Nut
16. Washer (2)
17. Bolt
18. Clamp
19. Clamp
20. Hose assembly
21. Union
22. Gasket
23. Hose assembly
24. Tube assembly
25. Tee
26. Nut
27. Gasket
28. Bolt
29. Packing (with retainer)
30. Elbow
31. Hose assembly
32. Reducer
33. Gasket
34. Reducer (3)
35. Gasket (3)
36. Tee
37. Hose assembly
38. Union
39. Gasket
40. Tube assembly
41. Union
42. Gasket
43. Bolt
44. Packing (with retainer)
45. Elbow
46. Lockwire
47. Plug
48. Gasket
49. Lockwire
50. Plug and bleeder
51. Gasket
52. Plug and bleeder
53. Gasket
54. Lockwire
55. Plug
56. Gasket
57. Lockwire
58. Plug and bleeder
59. Gasket

Figure 3-4. Hose and tube assemblies and plumbing fittings, removal and installation. (Sheet 1 of 2).

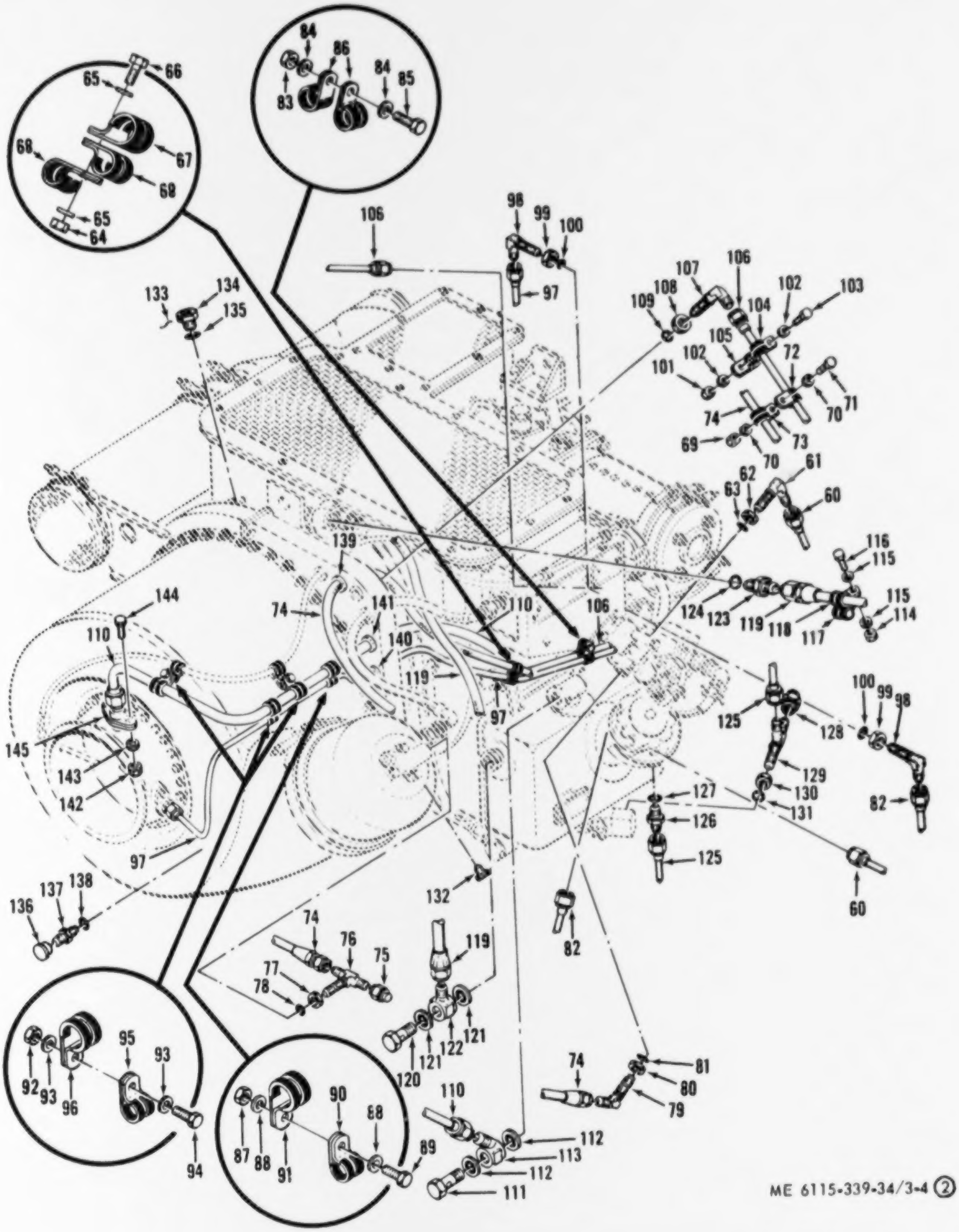


Figure 3-4. Hose and tube assemblies and plumbing fittings, removal and installation. (Sheet 2 of 2).

Key to figure 3-4 (2):
60. Tube assembly
61. Elbow
62. Nut
63. Gasket
64. Nut
65. Washer (2)
66. Bolt
67. Clamp
68. Clamp
69. Nut
70. Washer (2)
71. Bolt
72. Clamp
73. Clamp
74. Hose
75. Cap
76. Tee
77. Nut
78. Gasket
79. Elbow
80. Nut
81. Gasket
82. Tube assembly
83. Nut
84. Washer (2)
85. Bolt
86. Clamp
87. Nut
88. Washer (2)
89. Bolt
90. Clamp
91. Clamp
92. Nut (3)
93. Washer (6)
94. Bolt (3)
95. Clamp (3)
96. Clamp (3)
97. Tube assembly
98. Elbow (2)
99. Nut (2)
100. Gasket (2)
101. Nut
102. Washer (2)
103. Bolt
104. Clamp
105. Clamp
106. Tube assembly
107. Tube assembly
108. Nut
109. Gasket
110. Tube assembly
111. Bolt
112. Packing (with retainer)
113. Elbow
114. Nut
115. Washer (2)
116. Bolt
117. Clamp
118. Clamp
119. Hose assembly
120. Bolt
121. Packing (with retainer)
122. Elbow
123. Union
124. Gasket
125. Tube assembly
126. Union
127. Gasket
128. Cap
129. Tee
130. Nut
131. Gasket
132. Plug
133. Lockwire
134. Plug
135. Gasket
136. Cap
137. Union
138. Gasket
139. Grommet
140. Grommet
141. Grommet
142. Nut (2)
143. Washer (3)
144. Bolt (2)
145. Valve tube flange

Section II. ENGINE ACCESSORIES

3-5. General

This section contains those items which are considered accessories to the engine. They consist of the starter assembly, fuel control unit, fuel shutoff solenoid valve, thermostat bypass solenoid valve ignition unit, low oil pressure switch, oil pressure sequencing switch, tachometer generator, centrifugal switch assembly, oil cooler, oil tank assembly, oil pump assembly, fuel atomizer assembly, igniter plug, acceleration and overtemperature control thermostat, and thermocouple.

3-6. Starter Assembly

a. General. The starter assembly is a 24-volt dc high torque motor with a pawl and clutch mechanism installed on the motor shaft to absorb initial shock of starter rotation.

b. Removal. Refer to TM 5-6115-339-12 for starter assembly removal instructions.

c. Disassembly.

(1) Disassemble starter clutch according to sequence of index numbers assigned to figure 3-5 and observing the following.

(a) Support starter motor assembly and remove ring (3), assembled spider (6), pawls (5), and pins (4). Record the relative position of pawls (5) and spider (6) for aid at assembly. Remove pins (4) and pawls (5) from spider (6).

(b) Remove ring (7) and clutch plate (8). Compress spring (9) and remove retainer (10), clutch plate (8), spring (11), and washers (12).

(2) Disassemble starter motor according to sequence of index numbers assigned to figure 3-6 and observing the following.

(a) Do not remove nameplate (2) unless required after inspection.

(b) Do not remove ring (18) or insert (19) from cap (27) unless required after inspection.

(c) Do not disassemble disks (23), screws (24), or holders (26) from block assembly (25) unless required after inspection.

(d) Use a bearing puller to remove bearing (29).

(e) Support clutch housing (31) to drive out rollpin (30).

(f) Do not disassemble studs (38) from end bell assembly (39) unless required after inspection.

(g) Do not disassemble ring assembly (40 through 52) unless required after inspection. Do not remove rollpin (51) from ring (52) unless required after inspection.

d. Cleaning, Inspection, and Repair.

(1) *Cleaning.*

(a) Clean all nonelectrical parts with an approved solvent and dry with filtered compressed air.

(b) Clean all electrical parts with a soft bristle brush.

(2) *Inspection.*

(a) Visually inspect all parts for damage, distortion, and wear. Inspect all threads for stripped or crossed threads.

(b) Visually inspect machined surfaces for cracks, nicks, scratches, chipped surfaces, and worn spots.

(c) Inspect painted areas for blistering, flaking, chipping, and worn spots.

(d) Inspect nameplates (1, fig. 3-5 and 2, fig. 3-6) for illegibility and insecure attachment.

(e) Perform magnetic particle inspection on pin (4, fig. 3-5) pawls (5), and retainer (10).

(f) Inspect springs (10, fig. 3-6) for distortion by rolling springs across a flat surface. Check springs for a load of 1.50 pounds at a compressed length of 0.47 ± 0.002 inch; no permanent set must result from compressing spring.

(g) Inspect brush assemblies for damaged terminals and leads, chipping, and excessive brush wear; overall brush length must not be less than 3/16 inch.

(h) Inspect ring (18) and insert (19) for insecure installation in cap (27).

(i) Inspect brush holders (26) for distortion. Inspect disks (23) for insecure attachment and that disks provide adequate insulation.

(j) Inspect studs (38) for insecure installation in end bell assembly (39). Inspect insert in end bell assembly (39) for wear and scoring: inside diameter of insert must not exceed 1.5761 inch.

(k) Use a standard ohmmeter to check resistance of field coil assembly (50, fig. 3-6). Resistance of one coil must be the same as that of other coil within 10 percent of higher value. (fig. 3-17) for schematic wiring diagram of motor.

(l) Inspect rollpin (51, fig. 3-6) for insecure installation in ring (52).

(3) Repair.

(a) Replace insulator (5), bearings (29, 35), and seal (37) at each repair regardless of condition. Replace all parts that do not meet inspection requirements and are damaged beyond repair.

(b) If disks (23) or brush holders (26) require replacement, remove old disks with a sharp knife and carefully remove cement residue, using methyl-ethyl-ketone. Reassemble block assembly, installing new brush holders (26) on block assembly (25) with screws (24). Tighten screws (24) to a torque of 30 to 35 pound-inches. Apply cement to mating surfaces of disks (23) and screws (24) and install disks in block assembly (25). Clamp lightly and bake at approximately 275°F. (135°C for one hour).

WARNING

When maintenance procedures require the use of methyl-ethyl-ketone, make sure the procedure is accomplished in a well-ventilated area. Avoid breathing fumes. Keep away from flame.

(c) If armature assembly (32) shaft or splines are chipped or scored, replace armature assembly.

(d) If windings of armature assembly (32) are shorted, check for solder deposits between commutator bars. Remove solder deposits and recheck windings. If still shorted, replace armature assembly. If circuit is open in armature windings, check for thrown solder. Resolder where necessary, using pure tin and recheck circuit. If circuit is still open, replace armature assembly.

(e) Replace all brush assemblies (11, fig. 3-6) if any brush is worn beyond inspection requirements.

(f) If housing (31) must be replaced, check pin hole in housing for alignment with pin hole inshaft of armature assembly (32). If pin holes are not in line, rotate armature assembly 90 degrees and drill new hole in armature shaft using housing as a guide. If second hole has been previously drilled, use new armature assembly.

(g) If insert in endbell assembly (39) does not meet inspection requirements, replace endbell assembly.

(h) If roll pin (51) requires replacing, remove old pin and press in new pin flush with inside of ring (52). Apply thin coating of compound.

*e. **Reassembly***. Assemble starter assembly in reverse order of disassembly procedure using figures 3-5 and 3-6 and observing the following:

(1) Install screws (48, fig. 3-6) and coat with activator and allow to air-dry. Coat screws with staking compound.

(2) Place small amount of grease on armature shaft under shaft seal (37). Apply a thin film of sealant to seal (37) on side adjacent to insert in endbell assembly (39).

(3) If armature assembly (32) has been replaced, install housing (31) on shaft. Using existing hole in housing as a guide, drill 0.094-to 0.097 inch hole through shaft of armature. Press in new pin (30) flush with hub on both ends.

(4) Temporarily install cap assembly (18 through 27) into ring assembly (40 through 52) but do not install washers (28). Check armature end play, and adjust end play between 0.008 to 0.015 inch by adding or removing washers (28, fig. 3-6) as required. When proper end play is established, separate parts and apply zinc-chromate primer to mating surface of cap (27), ring (52), and threads of studs (38), and reassemble while primer is moist. Tighten nuts (12) to a torque of 30 to 40 inch-pounds.

(5) Perform motor bench test as described below (para 3-6 *f*) prior to assembly of starter clutch components.

(6) After satisfactory completion of starter motor bench test, coat plate assemblies (8, fig. 3-5) with oil and install with friction face of plates toward flange of retainer (10).

(7) Install pawls (5) in spider (6) and secure with pins (4). Install spring (9) in retainer (10), then install spider (6) in retainer with pawls oriented as noted at disassembly, and secure with retainer (3).

NOTE

Starter motor rotation is clockwise looking at mounting face.

(8) Lift up on end of spring (9) so that it is approximately parallel with clutch plate, then bend end of spring toward center of clutch at approximately a 45 degree angle.

(9) Install washers (12) and spring (11) on starter motor (13) with concave side of spring outward, then install plate assembly (8).

(10) Install retainer (10) and attached parts in motor clutch housing; retainer must bottom completely around entire groove in housing. Secure parts with ring (7).

(11) Use clutch torquing holder, torque wrench adapter, and a standard torque wrench to check clutch slip torque as shown in figure 3-8. Turn clutch through 15 complete turns, then tighten ring (3, fig. 3-5), with a spanner wrench to obtain a stabilized slip torque of 130 to 145 inch-pounds.

f. Bench Test.

(1) Install starter motor in a test setup similar to that shown in figure 3-9. Connect electrical test panel.

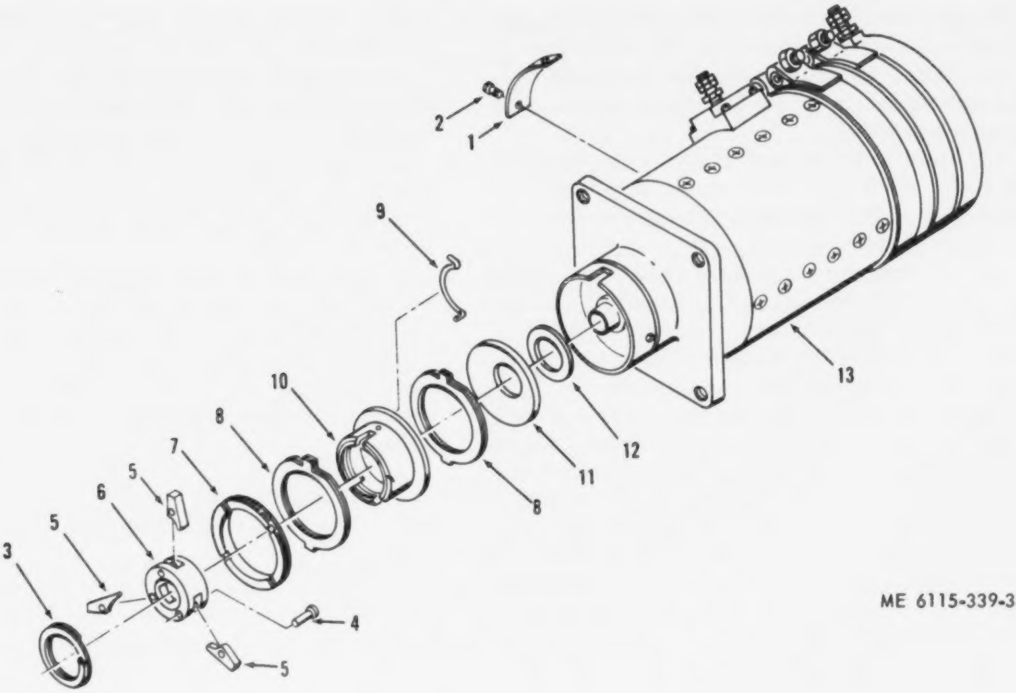
(2) If new brushes are installed in motor, run-in brushes, with no load, at 14 volts dc until brushes are seated on at least 80 percent of contact area. Check that motor operates in clockwise direction when viewed from shaft end.

CAUTION

Do not exceed motor duty of cycle of 1 minute on and 4 minutes off.

(3) Apply 27.5 ± 0.5 volts dc; close switch A (fig. 3-9) and open switch B. When motor is operating at full speed (18,000 to 25,000 rpm), bypass resistance by closing switch B. Motor must operate without unusual bearing noise, vibration, or interference between armature and poles, or commutator and brush holders. Check speed of motor. With 27.5 ± 0.5 volts dc applied, motor speed must be between 18,000 and 25,000 rpm, and current must not exceed 50.0 amperes.

g. Installation. Refer to TM 5-6115-339-12 for starter assembly installation instructions.



1. Nameplate
2. Screw
3. Ring
4. Pin (3)
5. Shaft drive pawl (3)
6. Spider
7. Ring, externally threaded
8. Starter clutch plate
9. Clutch spring
10. Slip clutch retainer
11. Starter clutch spring
12. Washer
13. Starter motor

Figure 3-5. Starter clutch exploded view.

Key to figure 3-6:

1. Screw
2. Nameplate
3. Decal
4. Clamp
5. Insulator
6. Screw (24)
7. Washer (12)
8. Washer (24)
9. Brush holder cap (4)
10. Brush spring (8)
11. Brush (8)
12. Nut (4)
13. Washer (4)
14. Nut (3)
15. Washer
16. Washer
17. Terminal stud
18. Ring
19. Insert
20. Screw (4)
21. Washer (4)
22. Washer (4)
23. Disk (4)
24. Screw (4)
25. Brush holder block
26. Brush holder
27. End cap
28. Washer
29. Bearing
30. Roll pin
31. Clutch housing
32. Armature
33. Screw (6)
34. Bearing retainer
35. Bearing
36. Washer
37. Shaft seal
38. Stud
39. Endbell
40. Nut (3)
41. Washer
42. Washer
43. Terminal stud
44. Screw (4)
45. Washer (4)
46. Terminal block
47. Terminal
48. Screw (24)
49. Field pole (8)
50. Field coil assembly
51. Roll pin
52. Field ring

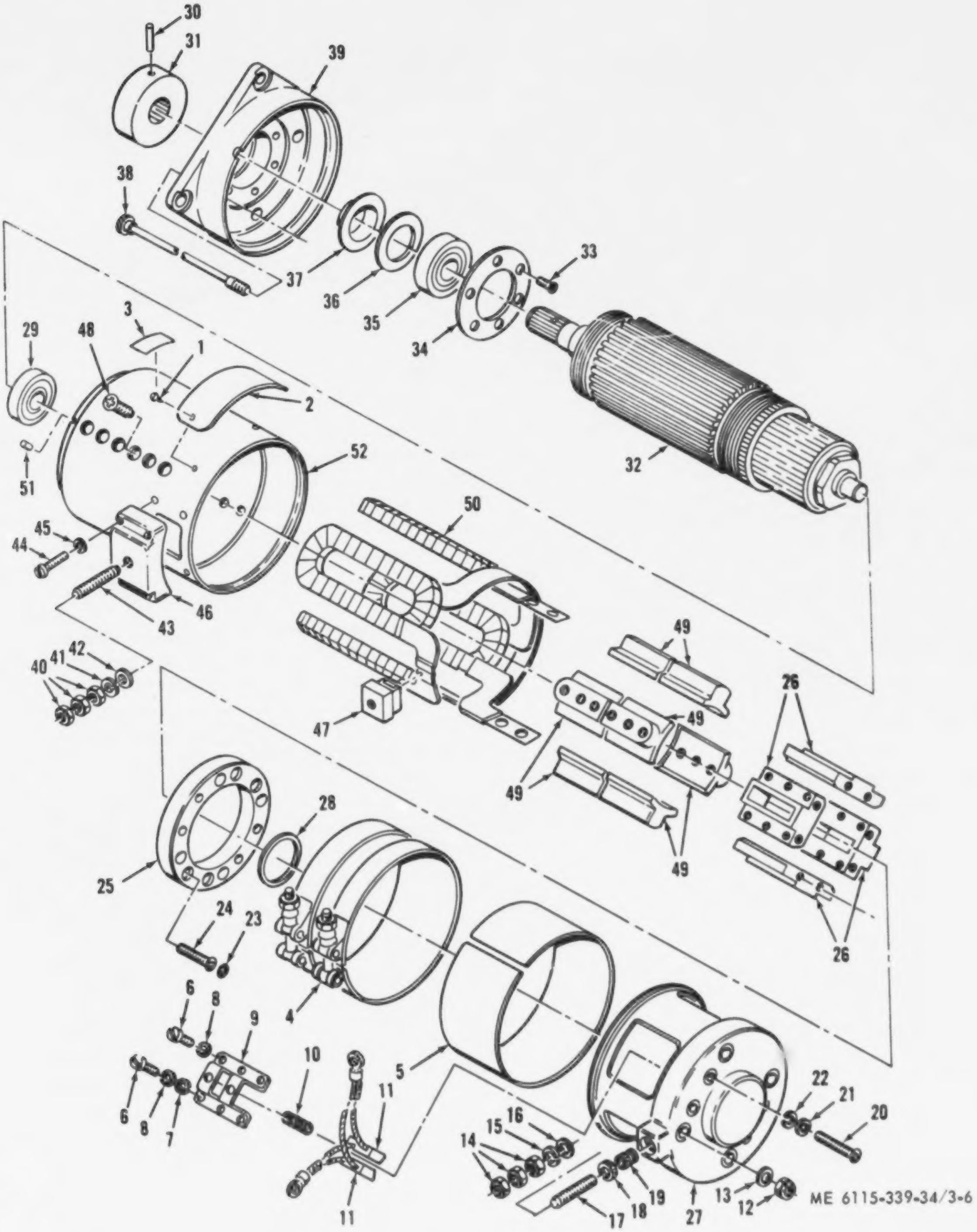
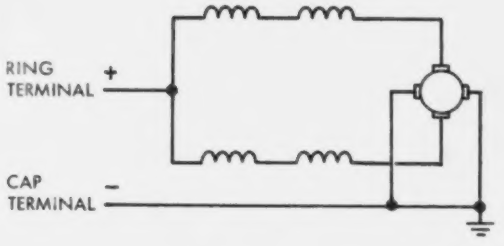


Figure 3-6. Starter motor exploded view.



NOTE:
COUNTERCLOCKWISE ROTATION VIEWING SHAFT END OF MOTOR.

ME 6115-339-34/3-7

Figure 3-7. Starter motor schematic diagram.

3-7. Fuel Control Unit

a. General. The fuel control unit pumps and regulates the flow of fuel to the fuel atomizer assembly in response to engine acceleration conditions and varying load conditions at governed speed.

b. Removal. Refer to figure 3-10 and remove the fuel control unit as follows:

CAUTION

Use nonmagnetic tools when working on or within 4 inches of the governor trim control motor. Prolonged exposure to magnetic tools will weaken the permanent magnet in the control motor.

(1) Disconnect wiring harness connector (1) from governor trim control motor.

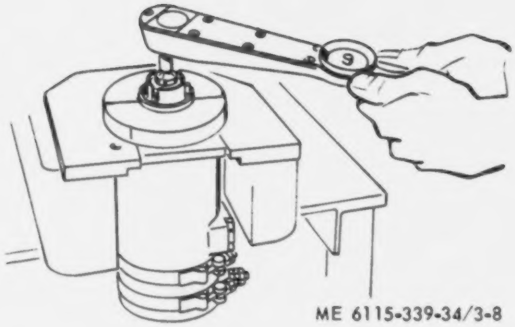
(2) Disconnect fuel inlet hose assembly (2) fuel drain hose assembly (3), fuel outlet tubing assembly (4), control air tubing assembly (5), and thermostat air tubing assembly (6).

(3) Remove screw (7), washer (8), nut (9), washer (10), bolt (11), and support (12).

(4) Remove nut (13), washer (14), fuel control unit (15), gasket (16), and insulator (17).

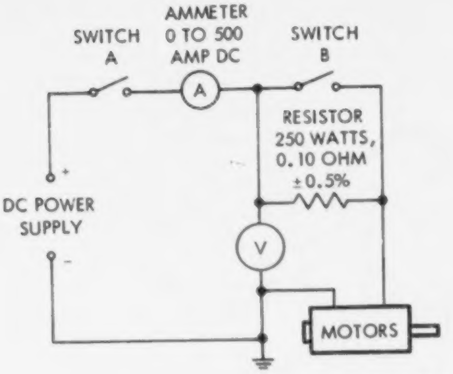
c. Cleaning, Inspection and Repair.

(1) Clean all disassembled metallic parts in an approved cleaning solvent. Clean the outside of governor trim motor with a lint free cloth moistened with an approved cleaning solvent and dry thoroughly with filtered compressed air. Clean electrical receptacle with a soft bristle brush.



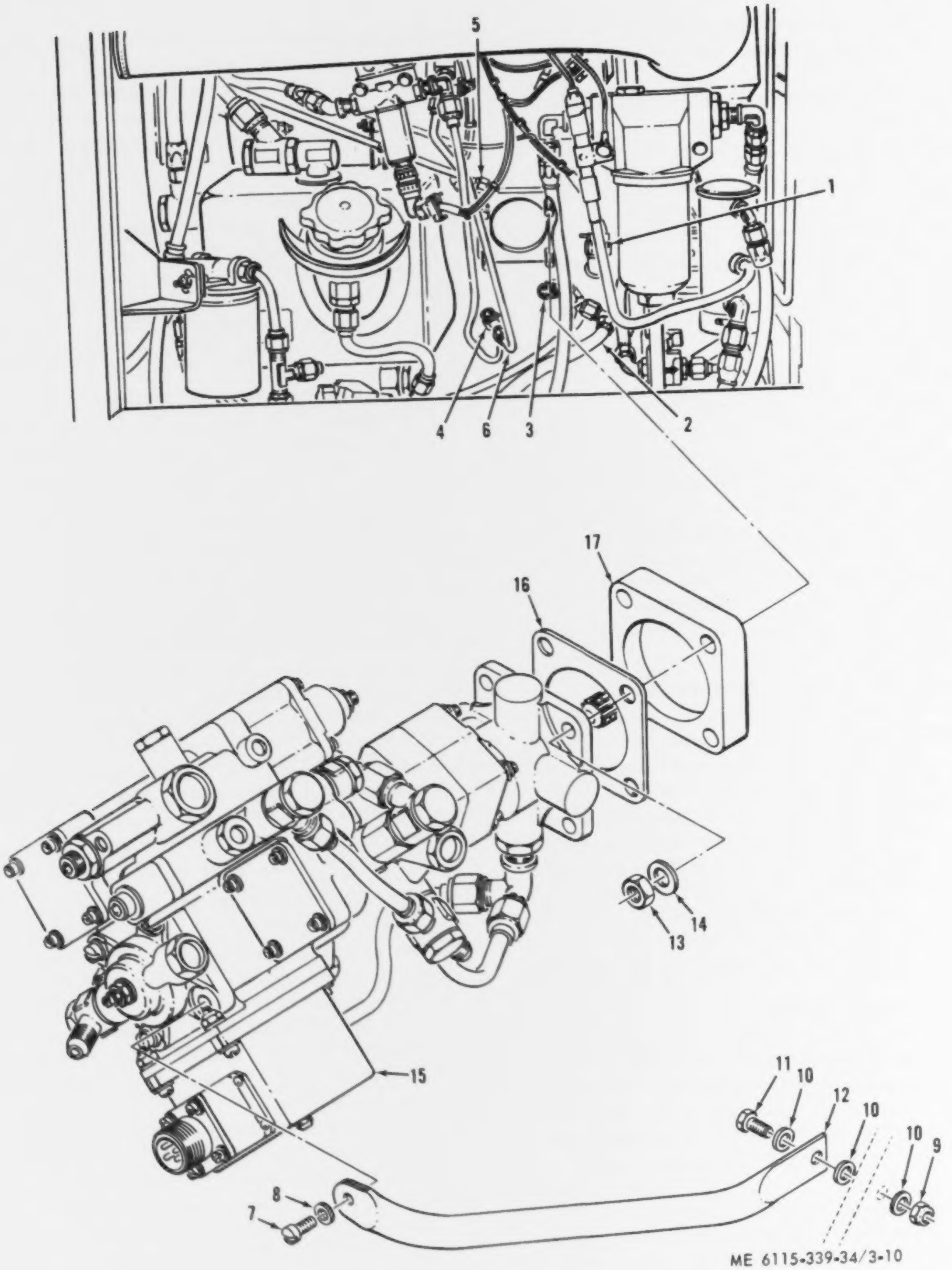
ME 6115-339-34/3-8

Figure 3-8. Using clutch torquing holder and torque wrench adapter to check clutch slip torque.



ME 6115-339-34/3-9

Figure 3-9. Starter motor test setup.



1. Wiring harness connector
2. Fuel inlet hose assembly
3. Fuel drain hose assembly
4. Fuel outlet tubing assembly
5. Control air tubing assembly
6. Thermostat air tubing assembly
7. Screw
8. Washer
9. Nut
10. Washer (3)
11. Bolt
12. Support
13. Nut (3)
14. Washer (3)
15. Fuel control unit
16. Gasket
17. Insulator

Figure 3-10. Fuel control unit, removal and installation.

(2) Visually inspect all threaded parts for stripped or crossed threads. Replace all damaged parts.

d. Installation. Install fuel control unit in reverse order of removal.

3-8. Fuel Shutoff Solenoid Valve

a. General. The fuel shutoff solenoid valve is an electromagnetic valve installed across the fuel line to the fuel atomizer assembly to control fuel flow between the fuel control unit and the fuel atomizer assembly.

b. Removal and Installation. Refer to TM 5-6115-339-12 to remove and install the fuel shutoff solenoid valve.

c. Inspection and Repair.

(1) Inspect valve inlet and outlet ports and electrical connection for stripped or crossed threads. Replace complete fuel shutoff solenoid valve if threads are damaged beyond simple repair.

(2) Use a multimeter to check for continuity between pins A and B in electrical receptacle. If no continuity is indicated, replace solenoid valve.

(3) Apply 1000 volts rms (root mean square) between pin A and case of solenoid for 1 minute. There must be no shorting. If short occurs replace fuel shutoff solenoid valve.

3-9. Thermostat Bypass Solenoid Valve

a. General. The thermostat bypass solenoid valve is an electromagnetic valve installed across the control air line between the fuel control unit and acceleration and overtemperature control thermostat. The valve functions to cut the thermostat out of the control system during extreme emergency operating conditions. The valve is energized through the PROTECTION BYPASS switch on the electrical controls instrument panel.

b. Removal and Installation. Refer to TM 5-6115-339-12 to remove and install the thermostat bypass solenoid valve.

c. Inspection and Repair.

(1) Inspect valve inlet and outlet ports and electrical connector for stripped or crossed threads. Replace solenoid valve if threads are damaged beyond simple repair.

(2) Use a multimeter to check for continuity between pins A and B in electrical receptacle. If no continuity is indicated, replace valve.

(3) Apply 1000 volts rms between pin A and case of solenoid for 1 minute. There must be no shorting. If shorting occurs replace solenoid valve.

3-10. Ignition Unit.

a. General. The ignition unit is a high voltage capacitor discharge type with a step-up transformer charging internal storage capacitors which build up the electrical charge across the engine igniter plug through a sealed gap booster coil system.

b. Removal and Installation. Refer to TM 5-6115-339-12 to remove and install the ignition unit.

c. Inspection and Repair.

(1) Inspect ignition unit housing and mounting bracket for cracks, separation, or other evidence of damage. If housing is damaged replace ignition unit.

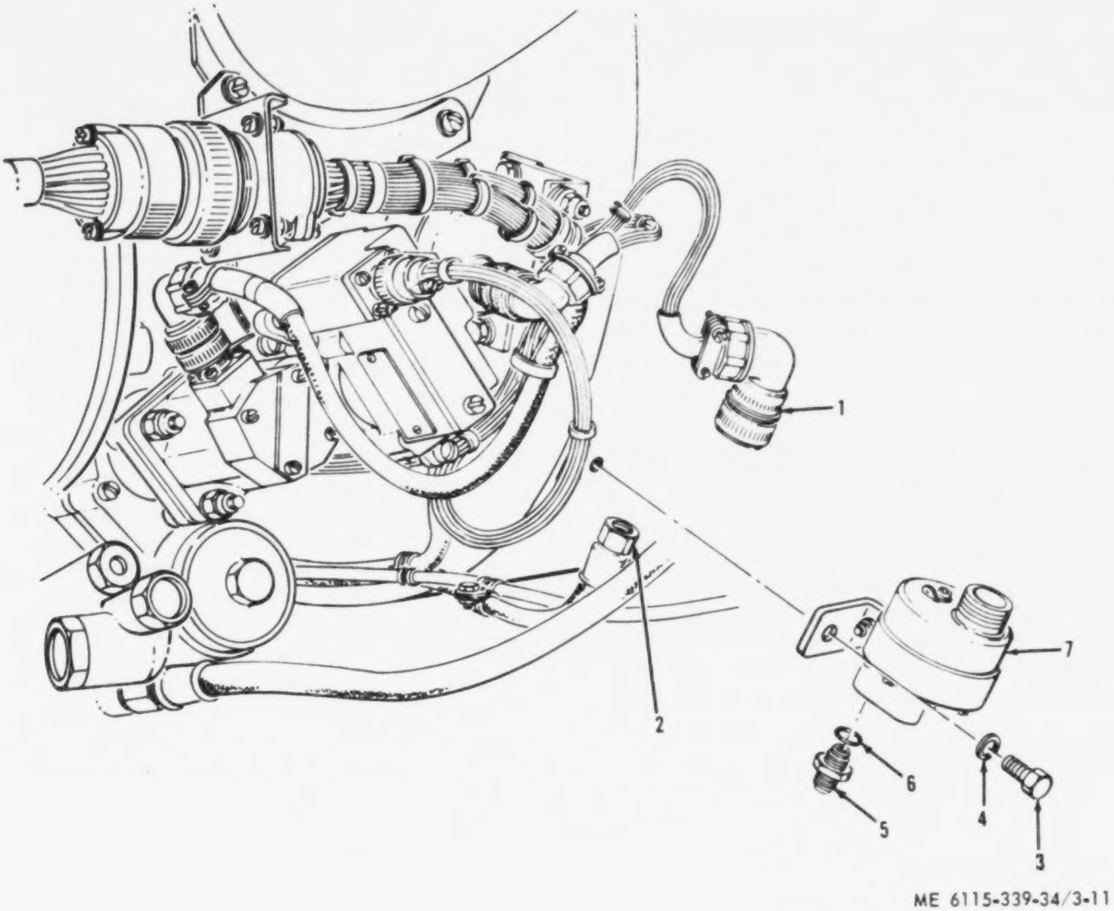
(2) Inspect threads on input terminal stud and output receptacle for stripped, peened, or crossed threads. If threads are damaged beyond simple repair, replace ignition unit.

d. Bench Test. Place ignition unit in a test setup capable of supplying regulated dc power at 0 to 30 volts to the ignition unit input terminal stud. Connect an igniter plug electrical lead and igniter plug to the ignition unit output receptacle. Ground igniter plug housing to negative side of dc power supply. Apply 10 volts dc to input terminal and observe that igniter plug assembly spark rate is at least 1 spark per second and that current input does not exceed 4.5 amperes. If ignition unit does not meet bench test requirements replace unit.

3-11. Low Oil Pressure Switch

a. General. The low oil pressure switch is a diaphragm actuated, adjustable switch which functions to interrupt the holding circuit and shutdown the engine in the event oil pressure drops below 55 ± 3 psig. The switch is isolated from the engine control holding circuit during engine starting and closes at 65 psig increasing oil pressure during engine starting.

b. Removal and Installation. Refer to figure 3-11 to remove and install the low oil pressure switch.



1. Wiring harness assembly
2. Oil hose assembly
3. Bolt (2)
4. Washer (2)
5. Union
6. Packing
7. Low oil pressure switch

Figure 3-11. Low oil pressure switch removal and installation.

c. Cleaning, Inspection and Repair.

(1) Remove all dust, dirt, and foreign matter from the low oil pressure switch with filtered compressed air. Clean the low oil pressure switch with an approved cleaning solvent and dry thoroughly.

(2) Inspect switch housing for cracks, dents, or other damage which might result in leakage. Replace low oil pressure switch if damaged.

(3) Inspect electrical receptacle and oil pressure boss for stripped, peened, or crossed threads. If threads are damaged beyond simple repair, replace low oil pressure switch.

d. Bench Test.

(1) Connect a regulated source of compressed air to oil pressure connection. Refer to figure 3-12.

(2) Connect a multimeter to pins A and B of the electrical connector.

(3) Gradually increase air pressure. The multimeter should indicate no continuity below 55±3 psig and should indicate continuity at 65 psig (maximum) and above.

(4) Connect multimeter to pins C and D of the electrical connector.

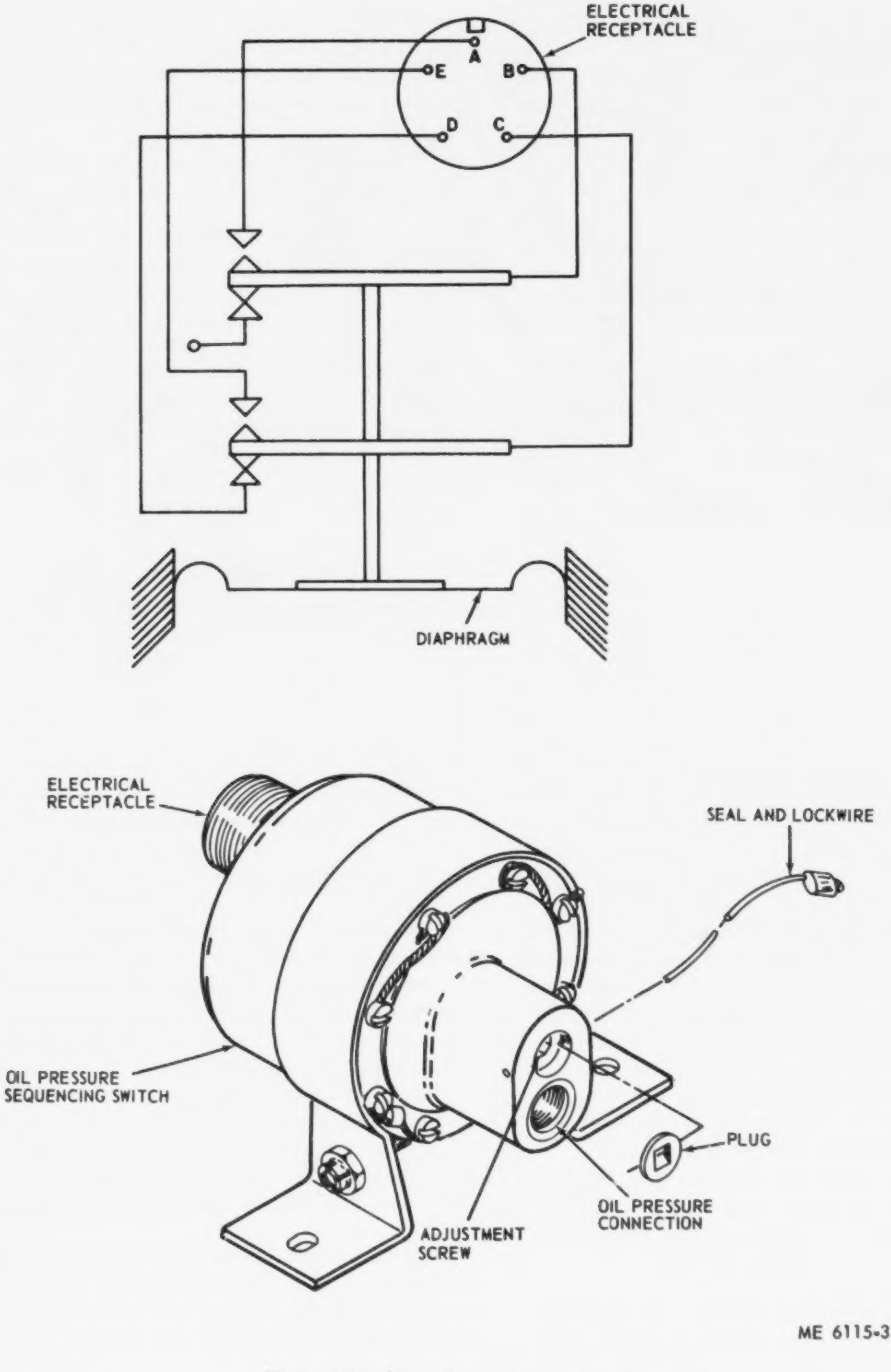
(5) Gradually decrease air pressure. The multimeter should indicate no continuity above 55±3 psig and should indicate continuity below 55 ± 3 psig.

(6) Contact actuation may be consecutive with a maximum of 1 psig differential, provided the upper and lower values fall within the limits specified in steps (3) and (5) above.

e. Adjustment.

(1) With low oil pressure switch connected for bench testing as described in *d* above, remove seal and lock wire and plug.

(2) Rotate adjustment screw as required to obtain switch actuation points specified in *d* above. If switch actuation points cannot be obtained by adjustment, replace low oil pressure switch.



ME 6115-339-34/3-12

Figure 3-12. Low oil pressure switch adjustment.

3-12. Oil Pressure Sequencing Switch

a. *General.* The oil pressure sequencing switch is an adjustable diaphragm actuated single pole double throw switch which functions to energize the fuel shutoff solenoid valve and the ignition unit during engine starting. The switch actuates with increasing oil pressure at 2.5 to 3.5 psig (approximately 10 percent governed engine speed) and remains closed until the engine is shutdown and oil pressure decreases to 1.5 psig.

b. *Removal.* Remove the oil pressure sequencing switch according to figure 3-13.

c. *Cleaning, Inspection, and Repair.*

(1) Remove all dust, dirt, and foreign matter from the oil pressure sequencing switch with filtered compressed air. Clean the oil pressure sequencing switch with an approved cleaning solvent and dry thoroughly.

(2) Inspect switch housing for cracks, dents, or other damage which might result in leakage. Replace oil pressure sequencing switch if damaged.

(3) Inspect electrical receptacle and oil pressure boss for stripped, peened, or crossed threads. If threads are damaged beyond simple repair, replace oil pressure sequencing switch.

d. *Bench Test.* Connect the oil pressure sequencing switch to a test setup as shown in figure 3-14 and perform bench test as follows:

(1) Connect a multimeter to pins A and B of switch electrical connector.

(2) Close valve (5) and open valves (2, 6). Gradually increase air pressure with regulator (7). Observe multimeter for switch actuation when continuity is indicated between pins A and B. Switch must actuate at 2.5 to 3.5 psig.

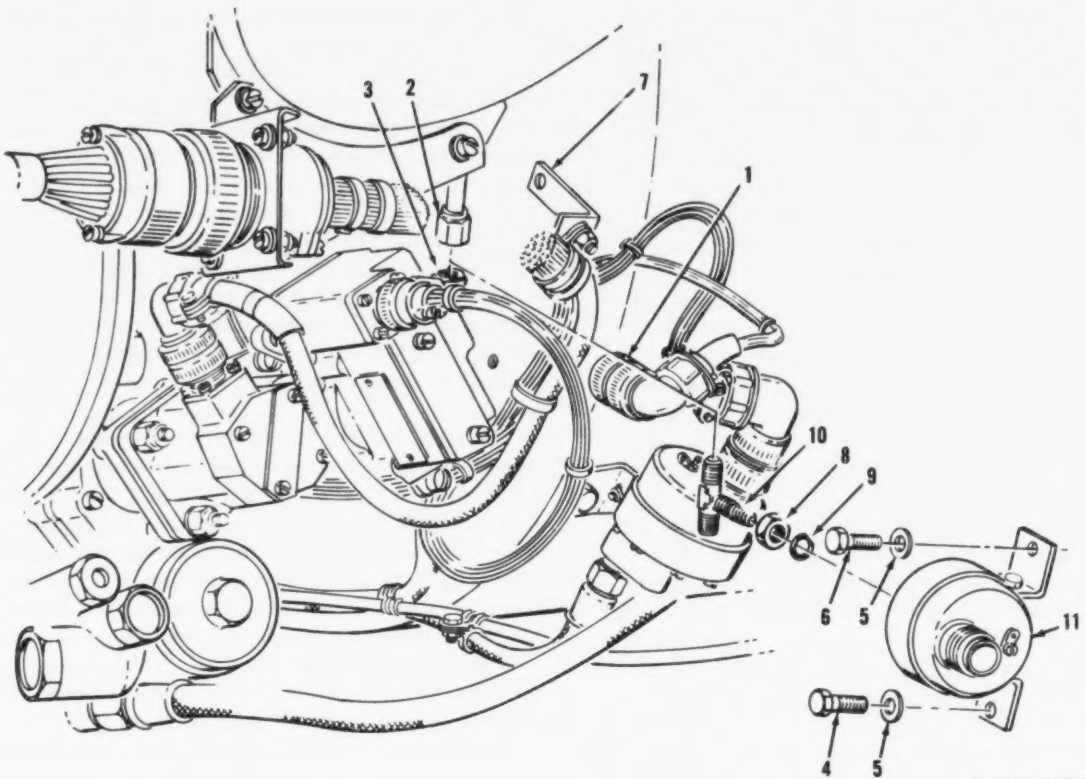
(3) After switch actuates, the following continuities must be indicated; circuit through pins A and B closed; circuit through pins A and C open.

(4) Open valve (5) and gradually bleed off air pressure and monitor multimeter connected to pins A and B. Switch must reset as indicated by loss of continuity between pins A and B at 1.5 psig minimum.

(5) After switch resets, the following continuities must be indicated; circuit through pins A and B open; circuit through pins A and C closed.

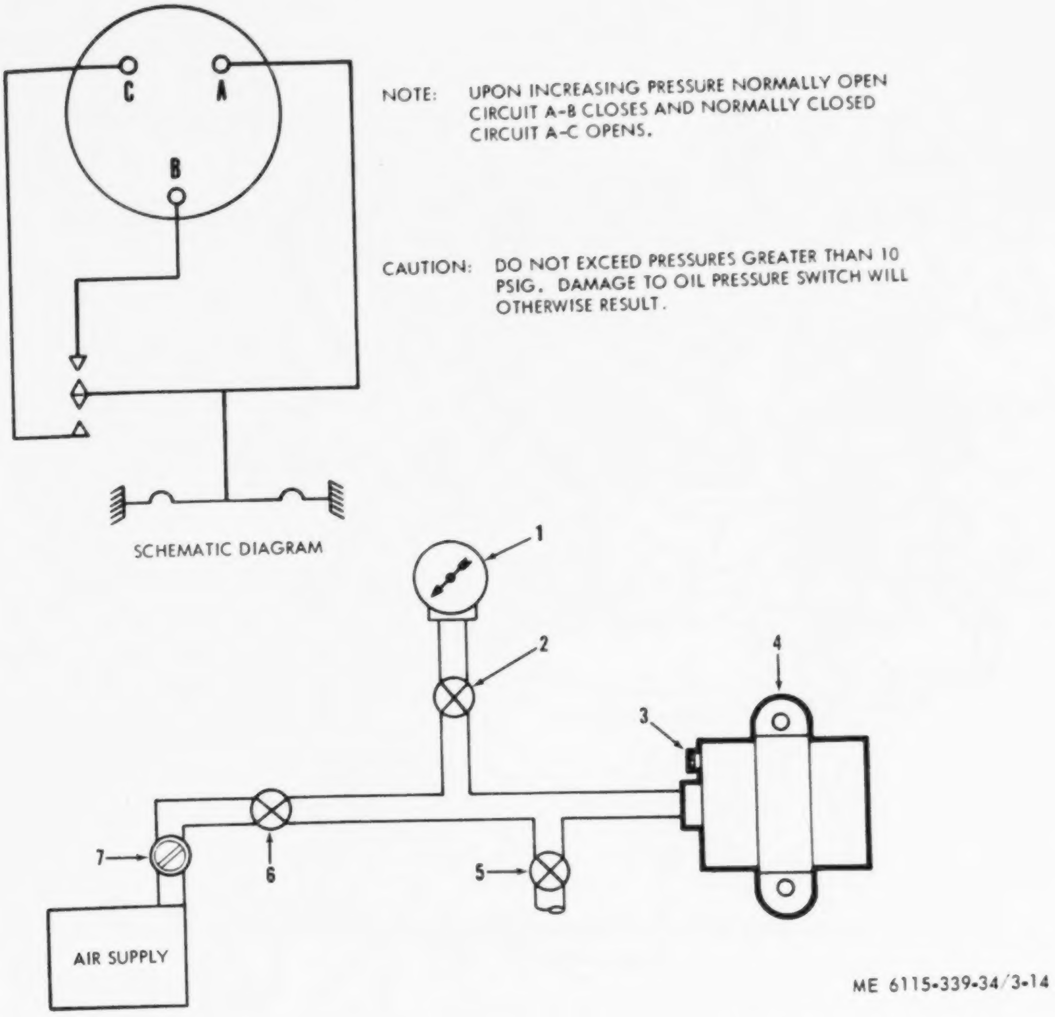
e. *Adjustment.* Adjust oil pressure sequencing switch (4, fig. 3-14) as required to being actuation and reset points within specified limits. Turning adjustment screw clockwise will set actuation point at lower pressure and counterclockwise will set actuation point at higher pressure. If oil pressure sequencing switch cannot be adjusted to specified limits, replace oil pressure sequencing switch.

f. *Installation.* Install the oil pressure sequencing switch in reverse order of removal procedure using figure 3-13.



1. Wiring harness assembly
2. Tube assembly
3. Hose assembly
4. Bolt
5. Washer
6. Bolt
7. Bracket
8. Nut
9. Packing
10. Tee
11. Oil pressure sequencing switch

Figure 3-13. Oil pressure sequencing switch removal and installation.



NOTE: UPON INCREASING PRESSURE NORMALLY OPEN CIRCUIT A-B CLOSES AND NORMALLY CLOSED CIRCUIT A-C OPENS.

CAUTION: DO NOT EXCEED PRESSURES GREATER THAN 10 PSIG. DAMAGE TO OIL PRESSURE SWITCH WILL OTHERWISE RESULT.

1. Pressure gage
2. Shutoff valve
3. Switch adjustment screw
4. Oil pressure sequencing switch
5. Shutoff valve
6. Shutoff valve
7. Air pressure regulator

Figure 3-14 Oil pressure sequencing switch test setup and schematic wiring diagram.

3-13. Tachometer Generator

a. General. The tachometer generator is a two-pole ac generator installed on the oil pump assembly and driven from the oil pump drive gear. The tachometer generator develops an ac signal with the signal frequency proportional to generator drive rpm. This signal when applied to a tachometer indicator will provide a visual indication of rpm.

b. Removal. Remove the tachometer generator according to sequence of index numbers assigned to figure 3-15.

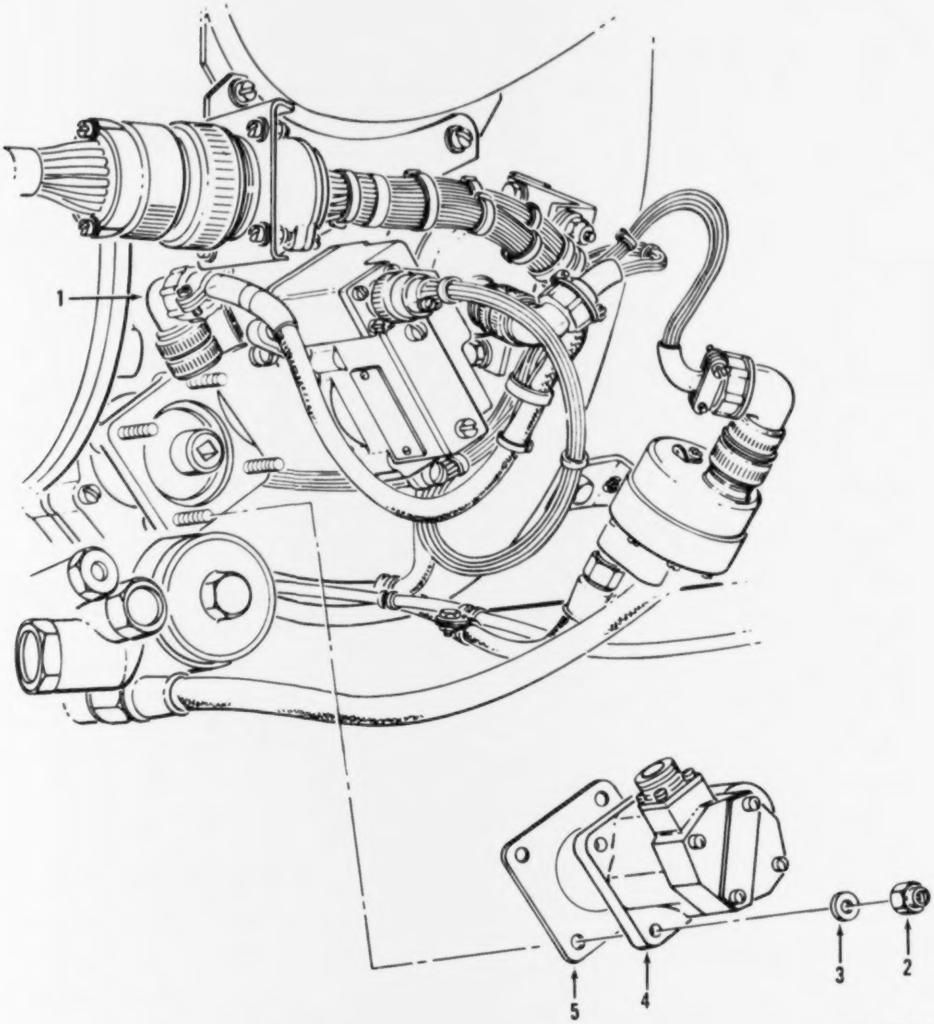
c. Cleaning, Inspection, and Repair.

(1) Remove all dust, dirt, and foreign matter from tachometer generator with filtered compressed air. Clean tachometer generator with a lint free cloth moistened with an approved cleaning solvent and dry thoroughly.

(2) Inspect electrical connector for damage. If connector is damaged beyond simple repair, replace tachometer generator.

(3) Functionally inspect tachometer generator according to Military Specification MIL-G-6027. If tachometer generator fails to meet functional inspection requirements, replace tachometer generator.

d. Installation. Install tachometer generator in reverse order of removal procedure using figure 3-15.



ME 6115-339-34/3-15

1. Wiring harness assembly
2. Nut (4)
3. Washer (4)
4. Tachometer generator
5. Gasket

Figure 3-15. Tachometer generator removal and installation.

3-14. Centrifugal Switch Assembly

a. Removal. Refer to figure 3-16 and remove the centrifugal switch as follows:

(1) Remove tachometer generator as described in paragraph 3-13.

(2) Disconnect wiring for harness assembly (1, fig. 3-16).

(3) Remove screws (2, and 3) and washers (4).

(4) Separate centrifugal switch assembly upper half (5) from the lower half (10).

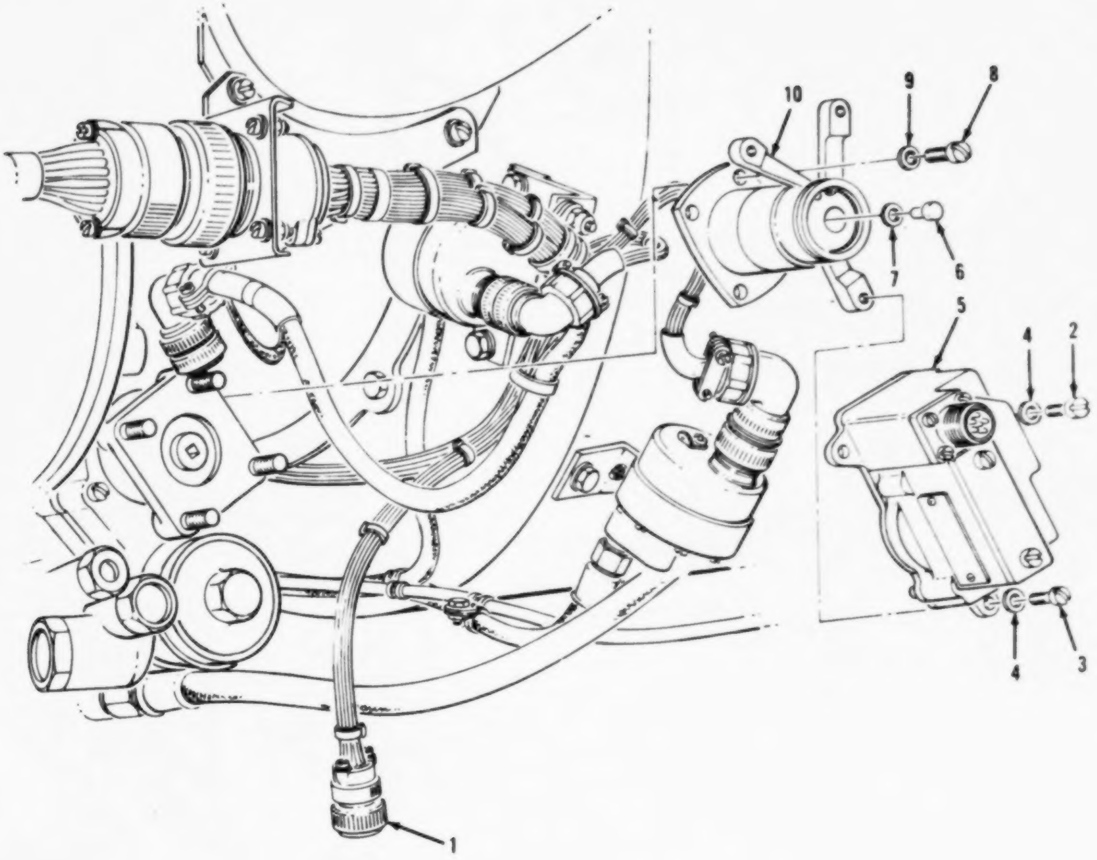
NOTE

Remove stud (6) and washer (7), record quantity and thickness of washers.

(5) Remove screws (8) and washers (9). Remove centrifugal switch lower half (10).

NOTE

When replacement is required, both halves of the switch assembly must be replaced.



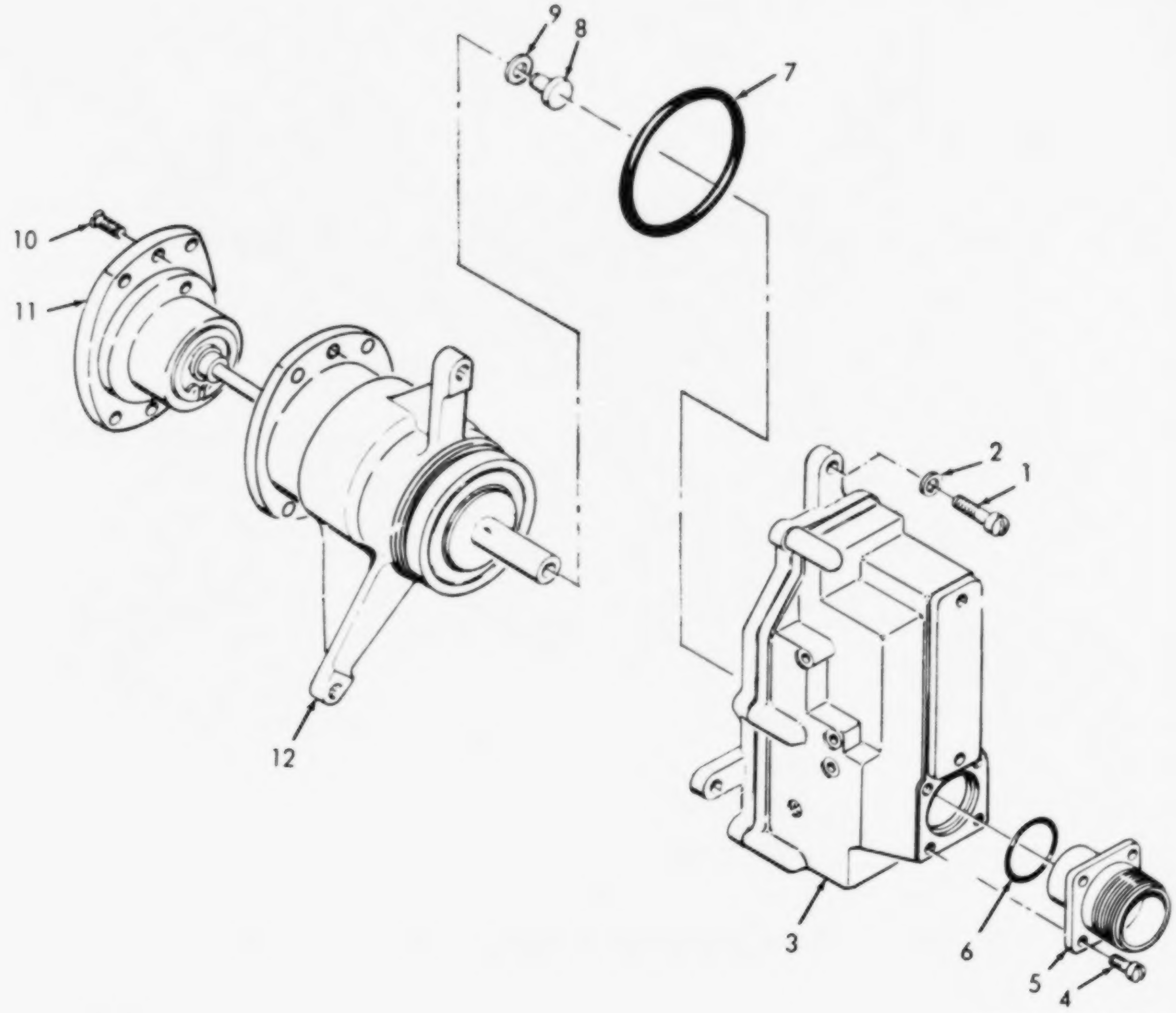
NOTE: RECORD QUANTITY AND THICKNESS OF WASHERS (7) TO FACILITATE ASSEMBLY.

ME 6115-339-34/3-16

1. Wiring harness assembly
2. Screw
3. Screw (2)
4. Washer
5. Switch assembly upper half
6. Stud
7. Washer
8. Screw (4)
9. Washer (4)
10. Switch assembly lower half

Figure 3-16. Centrifugal switch assembly removal and installation.

b. Disassembly. Refer to figure 3-17 to disassemble the switch assembly for repair.



1. Screw
2. Washer
3. Switch assembly upper half
4. Screw
5. Receptacle
6. Packing
7. Packing
8. Stud
9. Washer
10. Screw
11. Carrier assembly
12. Switch assembly lower half

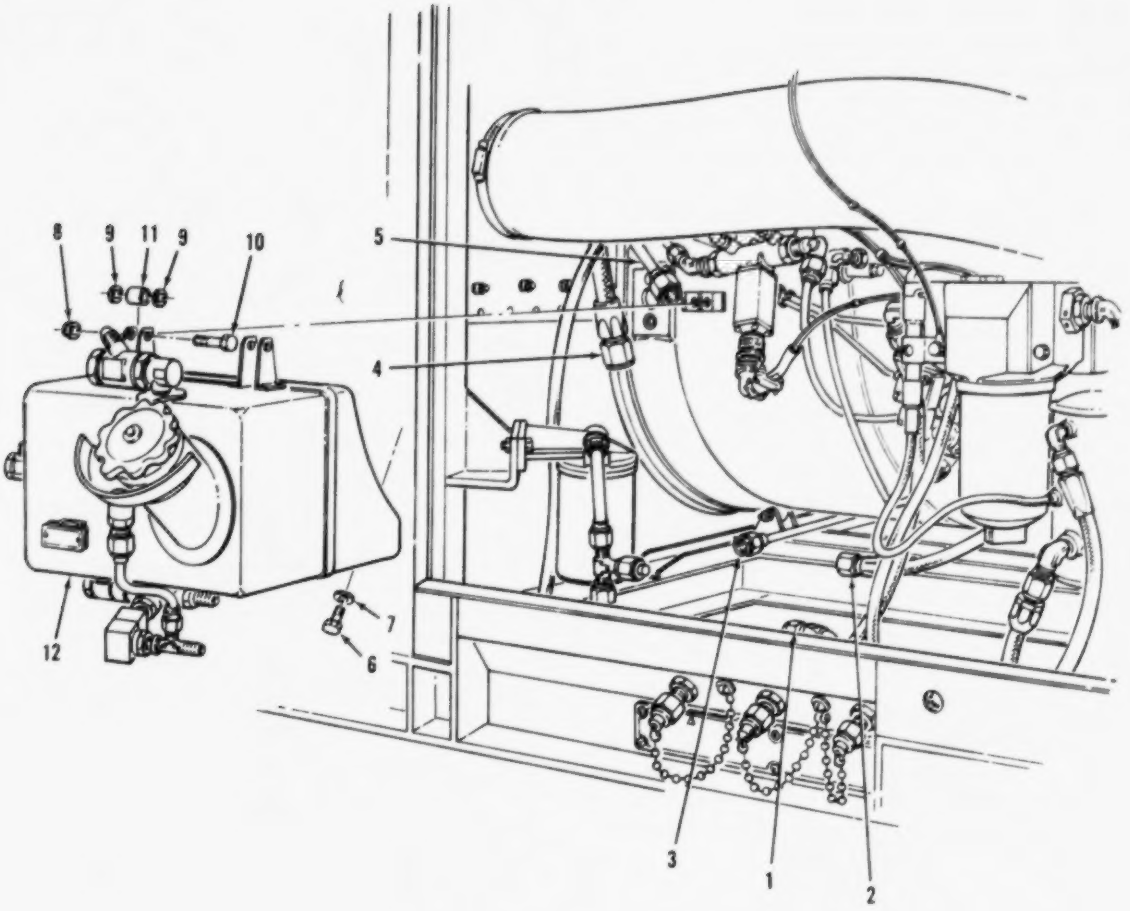
Figure 3-17. Centrifugal switch disassembly and reassembly.

c. Reassembly and Installation. Refer to figure 3-17 and reassemble the centrifugal switch assembly in reverse order of disassembly. Refer to figure 3-16 and install the centrifugal switch assembly in the reverse order of removal.

3-15. Oil Tank Assembly

a. General. The oil tank assembly is a 4-quart reservoir for the lubrication system. It incorporates a screened oil fill opening with oil fill cap and dipstick assembly, oil drain valve with connections to the external OIL DRAIN fitting on the generator set inclosure, and an internal air oil separator with air vent to the turbine exhaust flange.

b. Removal. Refer to figure 3-18 to remove the oil tank assembly.



ME 6115-339-34/3-18

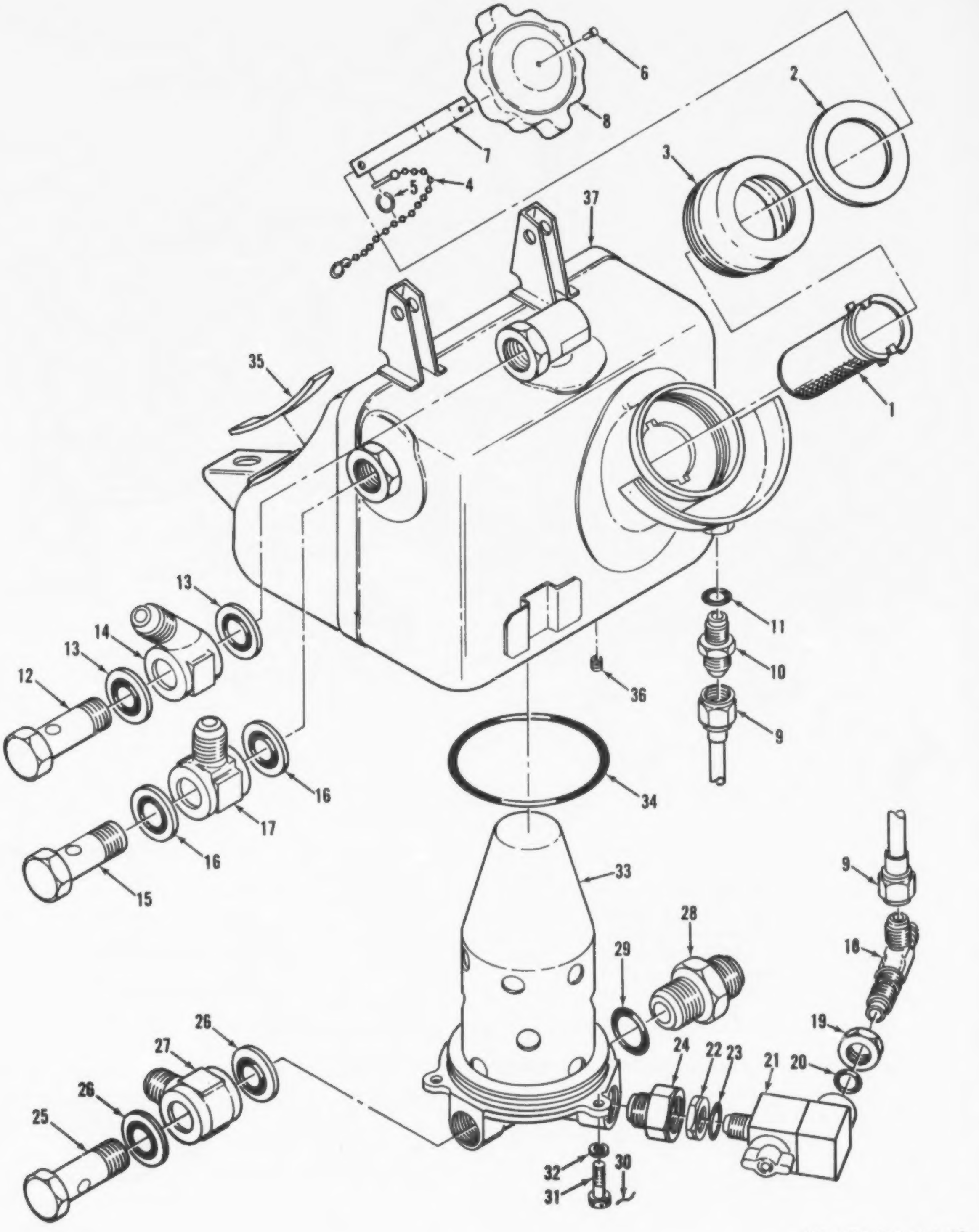
1. Hose assembly	7. Washer
2. Hose assembly	8. Nut
3. Hose assembly	9. Washer
4. Hose assembly	10. Bolt
5. Tube assembly	11. Spacer
6. Bolt	12. Oil tank assembly

Figure 3-18. Oil tank assembly removal and installation.

c. Disassembly and Reassembly. Refer to figure 3-19 to disassemble and reassemble the oil tank assembly. Do not disassemble cap (8), dipstick (7) or rivet (6) unless damage is indicated by inspection. Do not remove pads (35) or inserts (36) unless damage is indicated.

(1) During reassembly coat threads of filler neck (3) with cement at installation of oil tank.

(2) Orient cover assembly (33) to position DRAIN boss under oil tank filler neck.



ME 6115-339-34/3-19

Figure 3-19. Oil tank assembly, exploded view.

Key to figure 3-19:
1. Screw assembly
2. Gasket
3. Filler neck
4. Chain
5. Ring (2)
6. Rivet
7. Dipstick
8. Cap
9. Tube assembly
10. Union
11. Gasket
12. Bolt
13. Packing w / retainer
14. Elbow
15. Bolt
16. Packing w / retainer
17. Elbow
18. Tee
19. Nut
20. Gasket
21. Valve, oil drain
22. Nut
23. Gasket
24. Bushing
25. Bolt
26. Packing w / retainer
27. Elbow
28. Union
29. Packing
30. Lockwire
31. Bolt (3)
32. Washer (3)
33. Cover assembly
34. Packing
35. Pad (2)
36. Insert (3)
37. Oil tank

d. Cleaning and Inspection.

NOTE

Before cleaning tank assembly components, inspect tank assembly (37, fig. 3-19) interior, cover assembly (33), and screen assembly (1) for foreign particles or metal chips which might indicate damage to other turbine engine parts.

(1) Clean tank assembly (37) externally, using an approved cleaning solvent and a fiber bristle brush.

NOTE

Do not use steam, soap, or alkalies for cleaning.

(2) Clean tank assembly (37) internally by flushing with an approved cleaning solvent. Drain tank and dry thoroughly. Repeat flushing procedure using an approved carbon remover. After flushing with carbon remover, repeat flushing procedure using cleaning solvent, then dry thoroughly. Vapor degrease tank to remove any trace of oil or solvent that may remain in tank.

NOTE

Do not vapor degrease tank assembly (37) until all carbon deposits are flushed out, as vapor degreasing tends to harden carbon.

e. Testing.

(1) Attach a source of compressed air to oil tank vent port.

(2) Plug all remaining open ports.

(3) Submerge oil tank assembly in a hot water tank with water temperature approximately 65° to 77°C (150° to 170°F).

(4) Apply 3.0 psig air pressure to oil tank and check for leakage. No leakage is permitted.

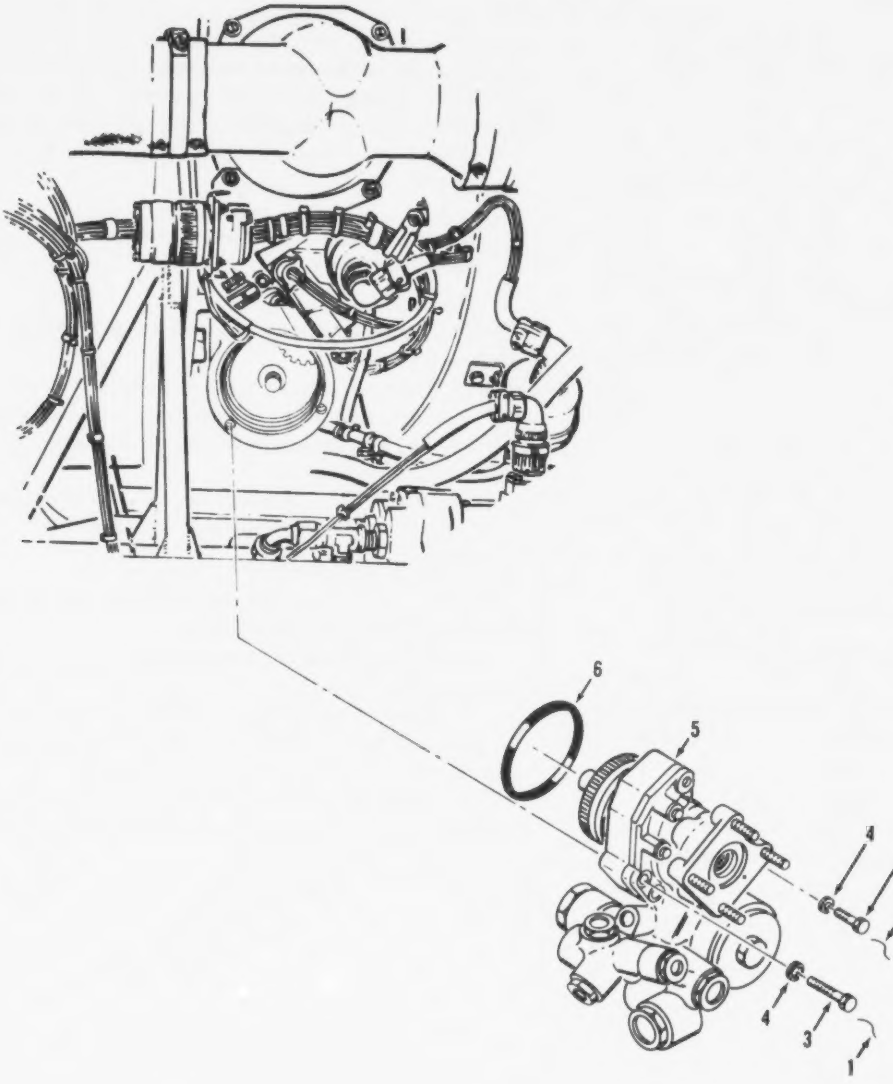
3-16. Oil Pump Assembly

a. Removal. Refer to figure 3-20 and remove the oil pump assembly as follows:

(1) Remove tachometer generator as described in paragraph 3-13.

(2) Remove plumbing connections to oil pump assembly. Tag or otherwise identify plumbing connections to aid at reassembly.

(3) Remove lockwire (1), bolts (2, and 3), washers (4), oil pump assembly (5) and packing (6).

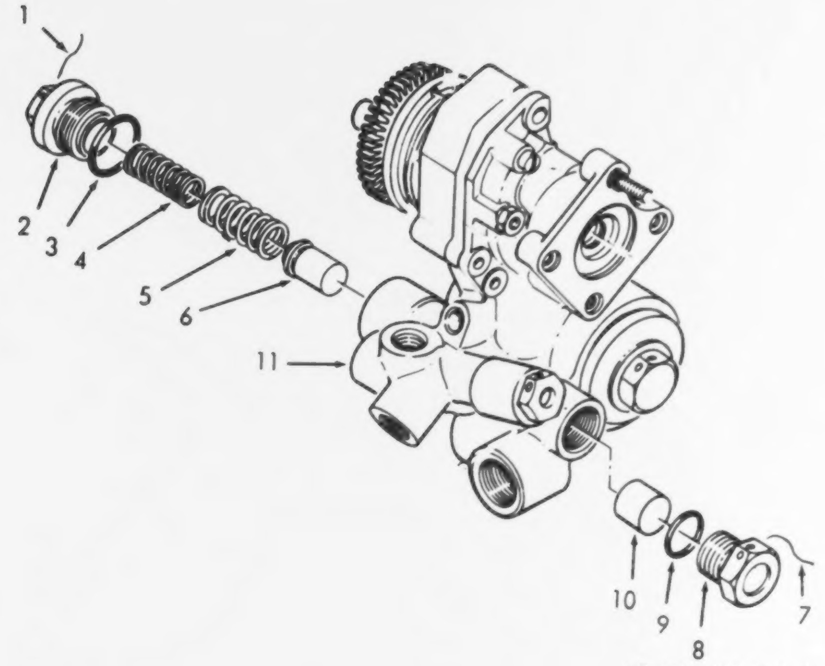


ME 6115-339-34/3-20

1. Lockwire
2. Bolt
3. Bolt
4. Washer
5. Oil pump assembly
6. Packing

Figure 3-20. Oil pump assembly removal and installation.

b. Disassembly and Reassembly. Refer to figure 3-21 to disassemble and reassembly the oil pump assembly.



1. Lockwire
2. Plug
3. Packing
4. Spring
5. Spring
6. Piston
7. Lockwire
8. Plug
9. Packing
10. Plug
11. Oil pump assembly

Figure 3-21. Oil pump assembly disassembly and reassembly.

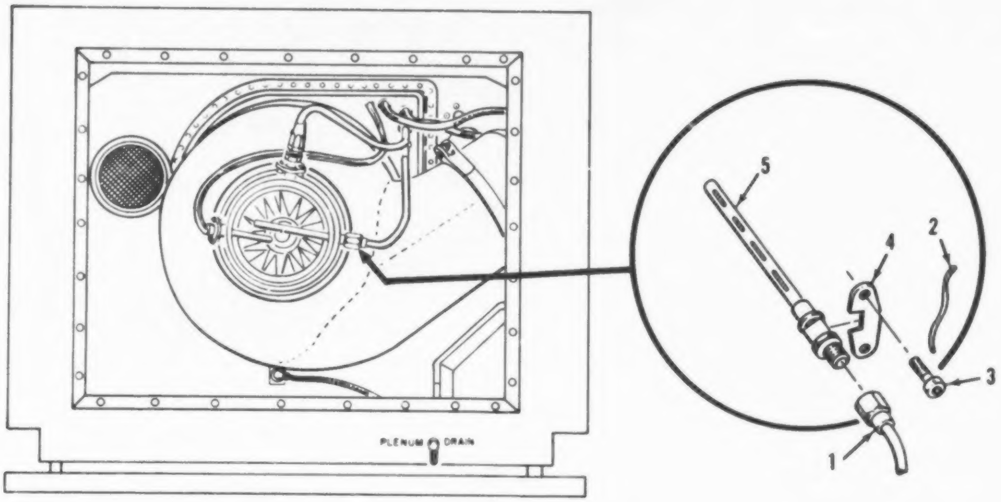
c. Inspection and Repair. Inspect all disassembled parts for corrosion, nicks, burrs, crossed, peened or otherwise damaged threads. Replace any damaged part.

d. Installation. Install oil pump assembly in reverse order of removal.

3-17. Acceleration and Overtemperature Control Thermostat.

a. General. The acceleration and overtemperature control thermostat is a pneumatic thermostat consisting of a steel alloy housing, spring loaded ball type bleed valve, temperature sensitive core assembly, and a fitting for connection of a pneumatic line. The thermostat functions to bleed off fuel control unit control air in relation to exhaust gas temperature to maintain exhaust gas temperature within operating limits.

b. Removal and Installation. Refer to figure 3-22 to remove and install the acceleration and overtemperature control thermostat.



CAUTION: HOLD THERMOSTAT BY HEXAGON FITTING WHILE
TIGHTENING OR LOOSENING "B" NUT ON TUBE
ASSEMBLY.

ME 6115-339-34/3-22

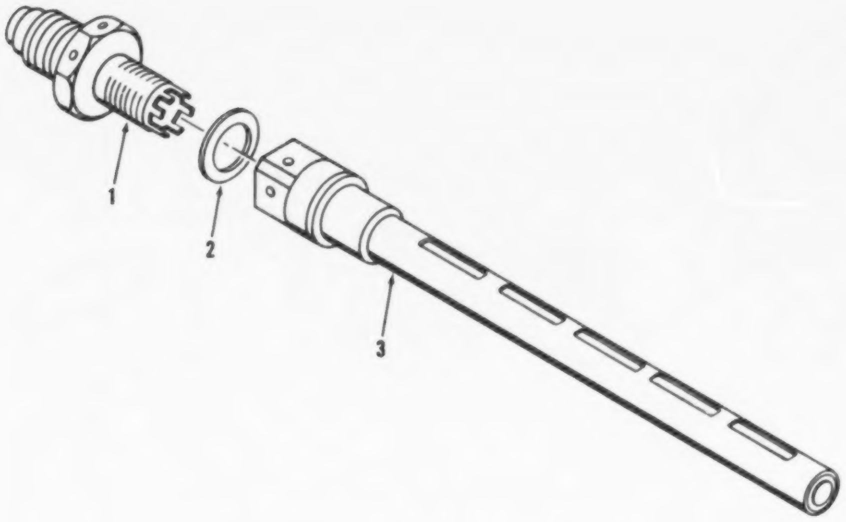
1. Control air tube
2. Lockwire
3. Screw (2)
4. Plate
5. Thermostat

Figure 3-22. Acceleration and overtemperature control thermostat removal and installation.

NOTE

Removal of thermostat may be faciliated by removing exhaust muffler assembly and cover assembly as outlined in TM 5-6115-339-12.

c. *Disassembly and Reassembly.* Refer to figure 3-23 to disassemble and reassemble the acceleration and overtemperature control thermostat.



ME 6115-339-34/3-23

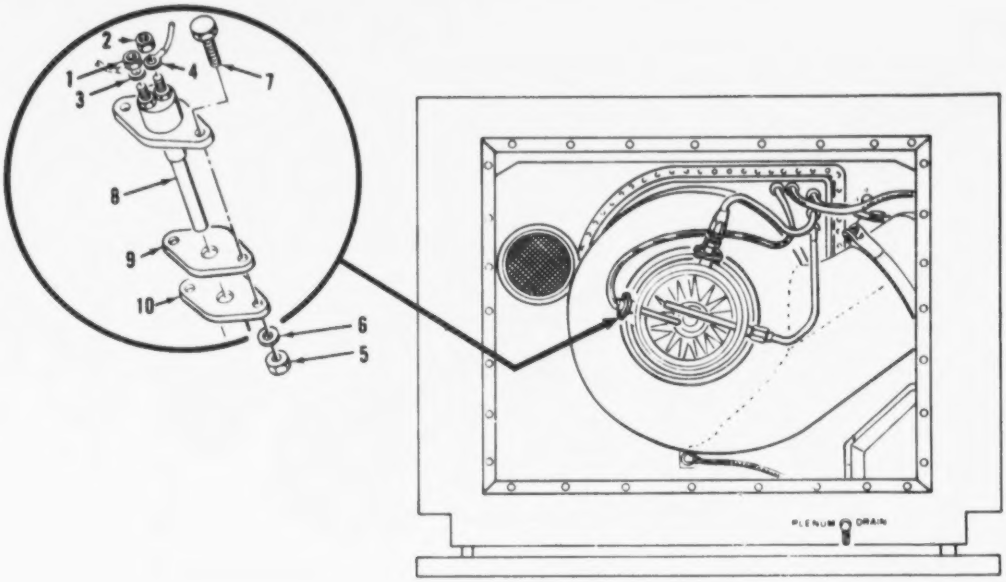
1. Fitting
2. Washer
3. Thermostat core assembly

Figure 3-23. Acceleration and overtemperature control thermostat disassembly and reassembly.

3-18. Thermocouple

a. *General.* The thermocouple is a temperature sensing device consisting of two wires of dissimilar material fused together at one end and connected to separate terminals at the other end. The thermocouple senses exhaust gas temperature and transmits the information to the exhaust gas indicator.

b. *Removal and Installation.* Refer to figure 3-24 to remove and install the thermocouple.



ME 6115-339-34/3-24

1. Nut
2. Nut
3. Wiring harness
4. Wiring harness
5. Nut (2)
6. Washer (2)
7. Bolt (2)
8. Thermocouple
9. Gasket
10. Exhaust mounting flange

Figure 3-24. Thermocouple removal and installation.

Section III. ENGINE COMBUSTION ASSEMBLY AND TURBINE ASSEMBLY

3-19. General

This section contains repair instructions for components of the engine combustion assembly and turbine assembly. The combustion assembly consists of those components which enclose the turbine assembly and the combustion area. The turbine assembly consists of the rotating and stationary components required to convert the energy developed in the combustion area to rotational mechanical energy.

3-20. Combustion Assembly

a. General. The combustion assembly consists basically of the muffler assembly, exhaust ejector assembly, combustor cap assembly, combustion chamber assembly, turbine exhaust flange and turbine plenum.

b. Removal. Remove combustion assembly components according to sequence of index numbers assigned to figure 3-25 observing the following.

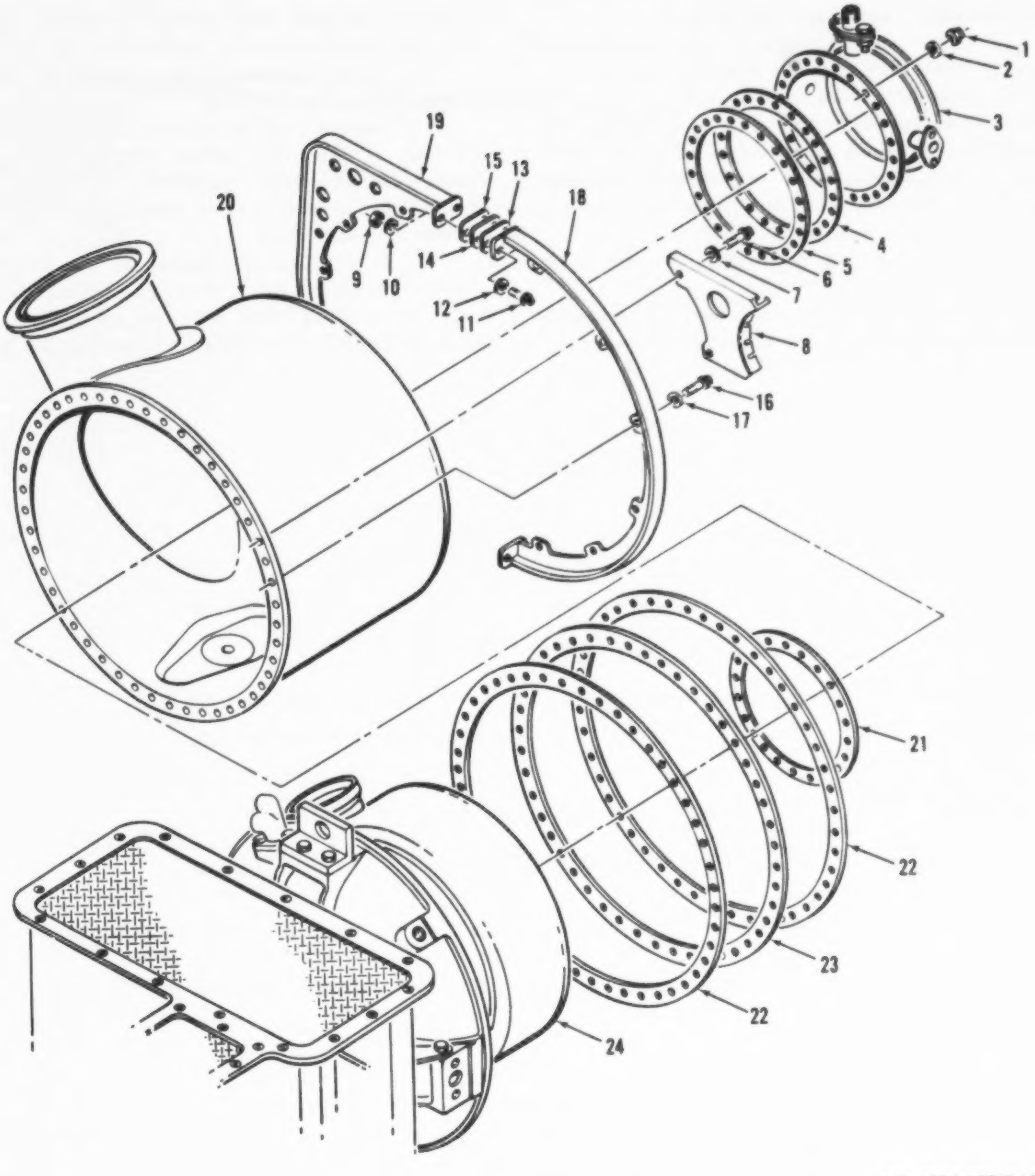
NOTE

Remove muffler assembly, exhaust ejector assembly, exhaust pipe assembly, combustor cap assembly, and combustion chamber assembly according to TM 5-6115-339-12.

(1) Remove gas turbine engine from enclosure according to paragraph 2-12. Remove thermostat according to paragraph 3-17. Remove thermocouple according to paragraph 3-18.

(2) Disconnect oil tank vent tube assembly from fitting on exhaust flange (3, fig. 3-25).

(3) Note quantity and thickness of washers (2) and gaskets (4, 5, 13, 14, 15, 21, 22, and 23) as removed to aid at assembly.



ME 6115-339-34/3-25

1. Nut (24)	13. Gasket
2. Washer	14. Gasket
3. Exhaust flange	15. Gasket
4. Gasket	16. Bolt (12)
5. Gasket	17. Washer (12)
6. Bolt (36)	18. Support
7. Washer (36)	19. Support
8. Bracket	20. Turbine plenum chamber assy.
9. Nut (4)	21. Gasket
10. Washer (4)	22. Gasket
11. Bolt (4)	23. Gasket
12. Washer (4)	24. Turbine assembly

Figure 3-25. Combustion assembly removal and installation.

c. Cleaning, Inspection and Repair.

(1) Clean components of the combustion assembly with an approved cleaning solvent.

(2) Repair cracks in combustion chamber assembly by stop drilling as shown in figure 3-26. Reweld any cracked tack welds. Replace combustor cap assembly and combustion chamber assembly if inspection requirements are not met and damage is beyond simple repair.

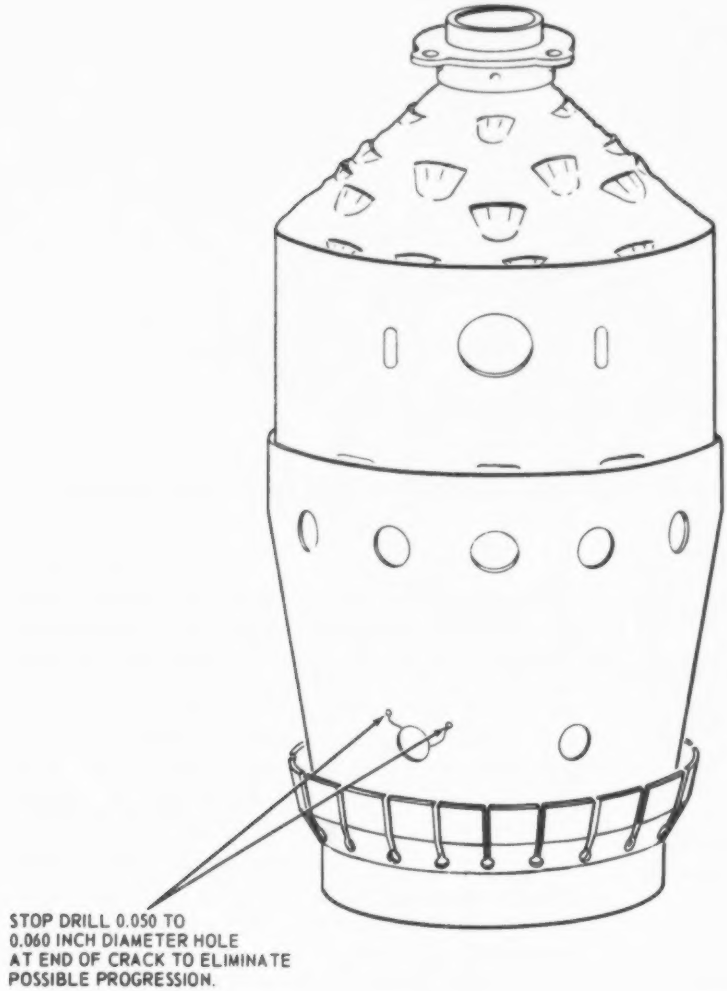
(3) Repair cracks in muffler assembly according to figure 3-27.

(4) Inspect exhaust ejector assembly for cracks and for damage to seal. Repair cracks by welding. If seal is damaged, drill out rivets, remove retainer and seal and install new seal and rivets.

(5) Inspect exhaust pipe assembly for cracks. Repair cracks by welding.

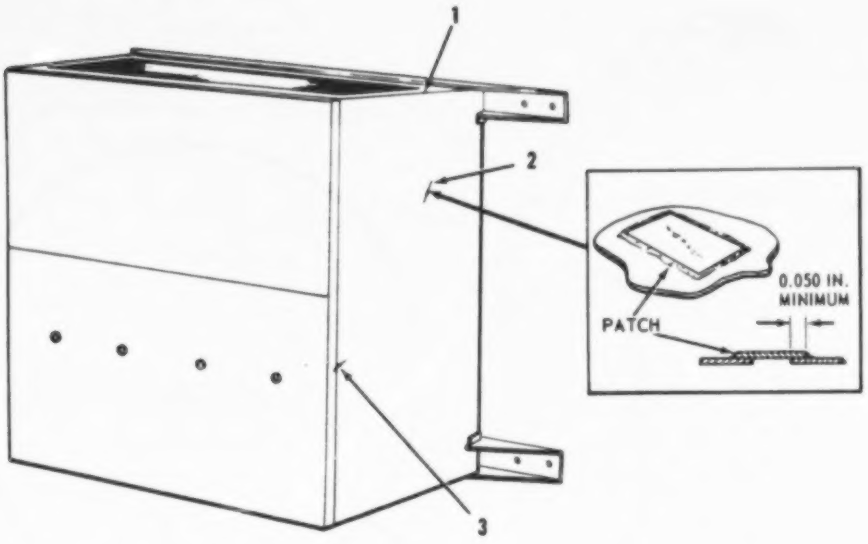
(6) Inspect turbine plenum (20 fig. 3-25) for cracks, breaks, or other damage. Perform fluorescent penetrant inspection of welded areas. Repair cracks or breaks in plenum by welding as shown in figure 3-28.

(7) Inspect exhaust flange (3, fig. 3-25) for cracked welds or other damage. Repair cracked welds by welding using filler rod per MIL-R-5031 Class 4 (Type 316) or class 6 (Type 19-9WX).



ME 6115-339-34/3-26

Figure 3-26. Combustion chamber assembly repair.



NOTES:

A. WELD PER TM 9-237 AND MIL-W-8611.

B. CLEAN AND WELD ANY CRACKS SUCH AS SHOWN AT 1 ABOVE OR ANY SPOT WELDED SEAMS THAT HAVE PARTED.

C. WELD PATCHES OVER CRACKS IN MATERIAL SUCH AS SHOWN AT 2 AND 3 ABOVE.

D. MINIMUM PATCH THICKNESS 0.025 INCH.

E. DO NOT OVERLAP PATCHES.

F. REMOVE ENOUGH MATERIAL TO ELIMINATE ALL TRACES OF CRACK.

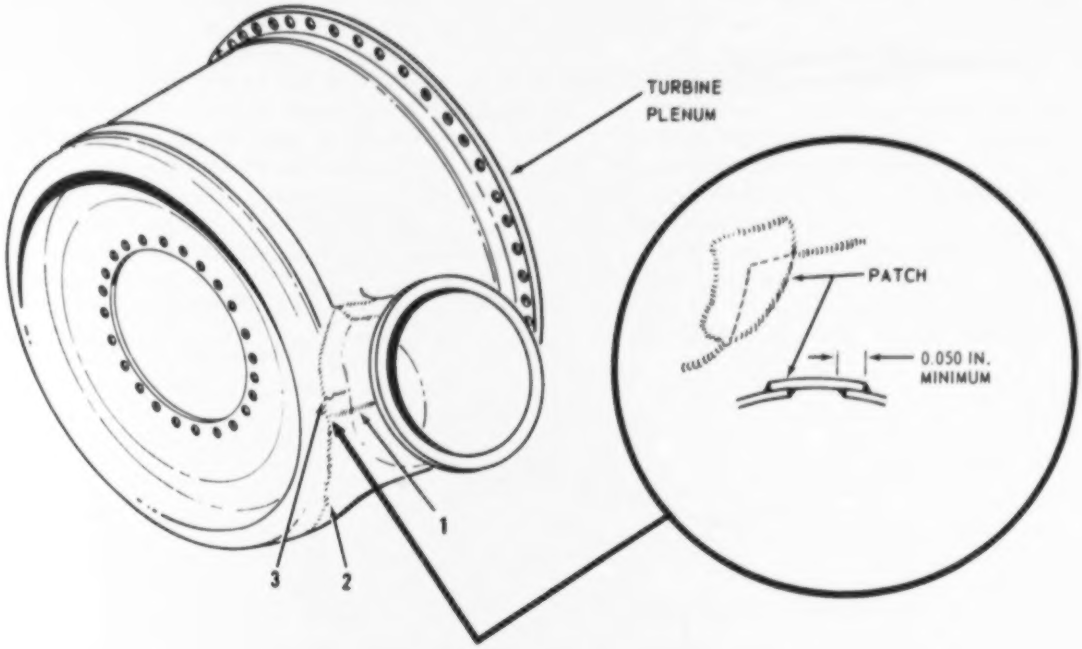
G. ITEMS 1, 2, AND 3 ARE TYPICAL OF THE TYPES OF CRACKS THAT MAY BE FOUND, BUT DO NOT INDICATE LOCATIONS WHERE CRACKS ARE LIKELY TO APPEAR.

H. RESISTANCE SEAM WELD PERMISSIBLE ONLY TO HOLD PIECES FOR FUSION WELDING.

J. MATERIAL CRES 321 PER SPECIFICATION MIL-S-6721 COMPOSITION T1.

ME 6115-339-34/3-27

Figure 3-27. Muffler assembly repair.



NOTES:

A. WELD PER TM 9-237 AND MIL-W-8611.

B. CLEAN AND REWELD ANY CRACK SHOWN IN ITEM 1.

C. ITEMS 2 AND 3 WILL REQUIRE PATCHES.

D. MINIMUM PATCH THICKNESS 0.035 INCH.

E. DO NOT OVERLAP PATCHES.

F. REMOVE ENOUGH MATERIAL SO AS TO ELIMINATE ALL TRACES OF CRACK.

G. ITEMS 1, 2, AND 3 ARE ILLUSTRATIVE OF THE TYPES OF CRACKS AND DO NOT INDICATE LOCATION WHERE A CRACK MAY APPEAR.

H. ALL PATCHES ARE TO BE WELDED ON THE OUTER SKIN OF THE PLENUM. NO NEGATIVE STEPS ARE ALLOWED INSIDE OF PLENUM.

I. INSIDE FLOW SURFACE AND JOINTS TO BE FREE OF EXCESS WELD.

J. RESISTANCE SEAM WELD NOT PERMISSIBLE OTHER THAN TO HOLD PIECES FOR FUSION WELDING.

K. PRESSURE TEST WELD AT 85 PSIG TO 90 PSIG. NO LEAKAGE PERMITTED

L. MATERIAL 321 CRES PER SPECIFICATION MIL-S-6721 COMP. T1.

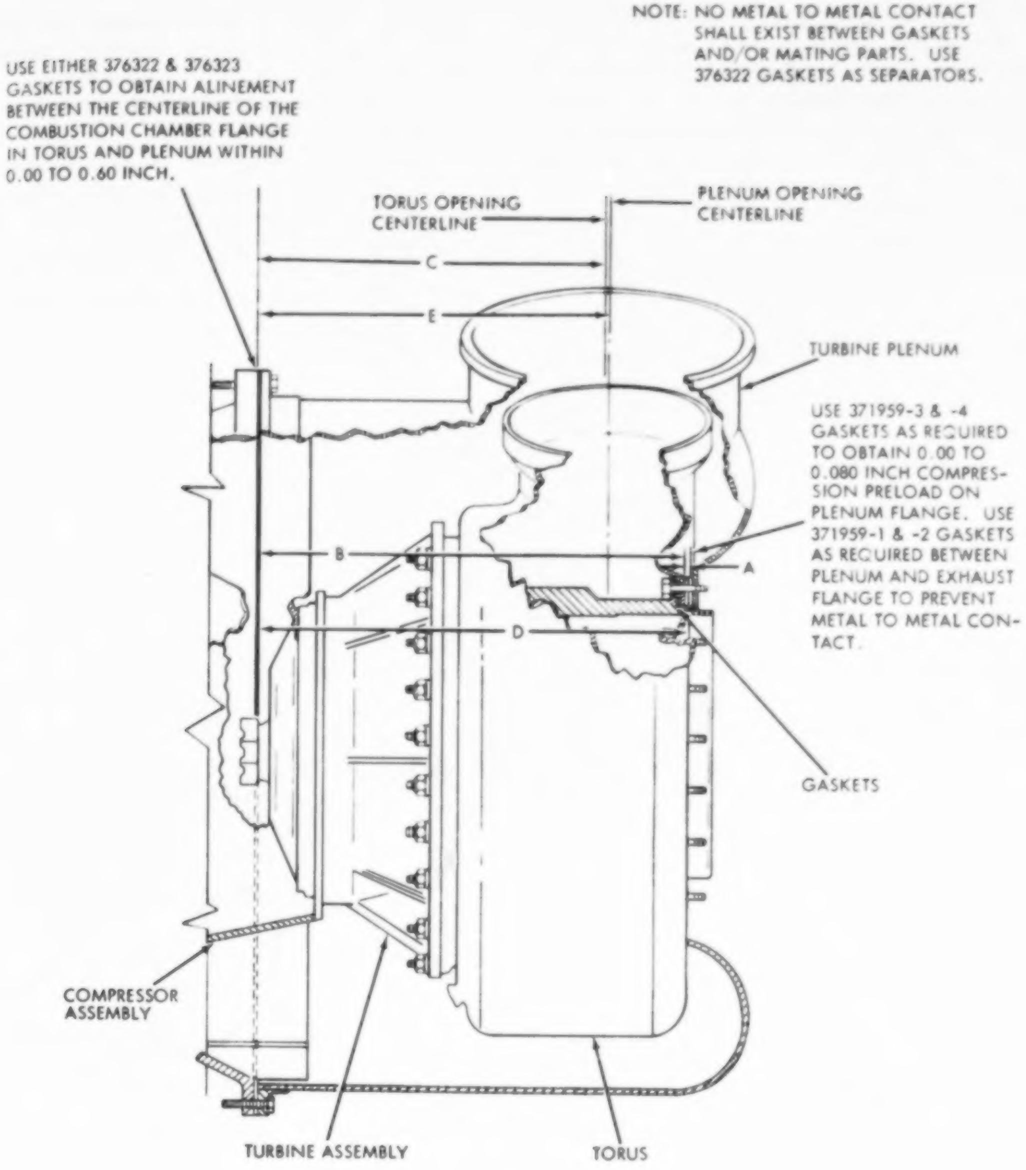
ME 6115-339-34/3-28

Figure 3-28. Turbine plenum repair.

d. Installation. Install combustion assembly components in reverse order of removal and observing the following:

(1) Install turbine plenum observing alinement requirements shown in figure 3-29.

(2) Use washers (2, fig. 3-25) as required to obtain correct nut to stud relationship. Use an approved high temperature thread compound on threads or nuts (1). Tighten nuts (1) to a torque of 40 to 60 inch-pounds. Refer to TM 5-6115-339-12 for installation of combustion chamber assembly, combustor cap, exhaust pipe, exhaust ejector, and muffler assembly.



NOTE: NO METAL TO METAL CONTACT SHALL EXIST BETWEEN GASKETS AND/OR MATING PARTS. USE 376322 GASKETS AS SEPARATORS.

USE EITHER 376322 & 376323 GASKETS TO OBTAIN ALINEMENT BETWEEN THE CENTERLINE OF THE COMBUSTION CHAMBER FLANGE IN TORUS AND PLENUM WITHIN 0.00 TO 0.60 INCH.

USE 371959-3 & -4 GASKETS AS REQUIRED TO OBTAIN 0.00 TO 0.080 INCH COMPRESSION PRELOAD ON PLENUM FLANGE. USE 371959-1 & -2 GASKETS AS REQUIRED BETWEEN PLENUM AND EXHAUST FLANGE TO PREVENT METAL TO METAL CONTACT.

E = C + 0.060 INCH (PLENUM OPENING CENTERLINE)
C = E - 0.060 INCH (TORUS OPENING CENTERLINE)
A = 0.0 TO 0.080 INCH CLEARANCE BEFORE INSTALLING EXHAUST FLANGE
D = B + A

ME 6115-339-34/3-29

Figure 3-29. Turbine plenum alinement.

3-21. Turbine Assembly

a. General. The turbine assembly consists basically of a turbine wheel with integral shaft, bearing housing, bearings, nozzle and shroud assembly, torus, and an air-oil seal. The turbine wheel is a radial inward-flow type. The turbine wheel shaft is supported in the bearing housing by two pressure-lubricated ball bearings. A carbon seal, located between the turbine wheel and the adjacent bearing, prevents entrance of air around the turbine wheel to the oil cavity. The nozzle and shroud assembly forms a close fitting shroud at the turbine wheel, and contains nozzle vanes which receive the hot gases from the combustion chamber and direct the gases against the turbine wheel blades. A heat shield mounted on the bearing housing prevents excessive heat from penetrating to the shaft bearings. The torus mates with the discharge end of the combustion chamber assembly and directs combustion gases into the nozzle vanes leading to the turbine wheel.

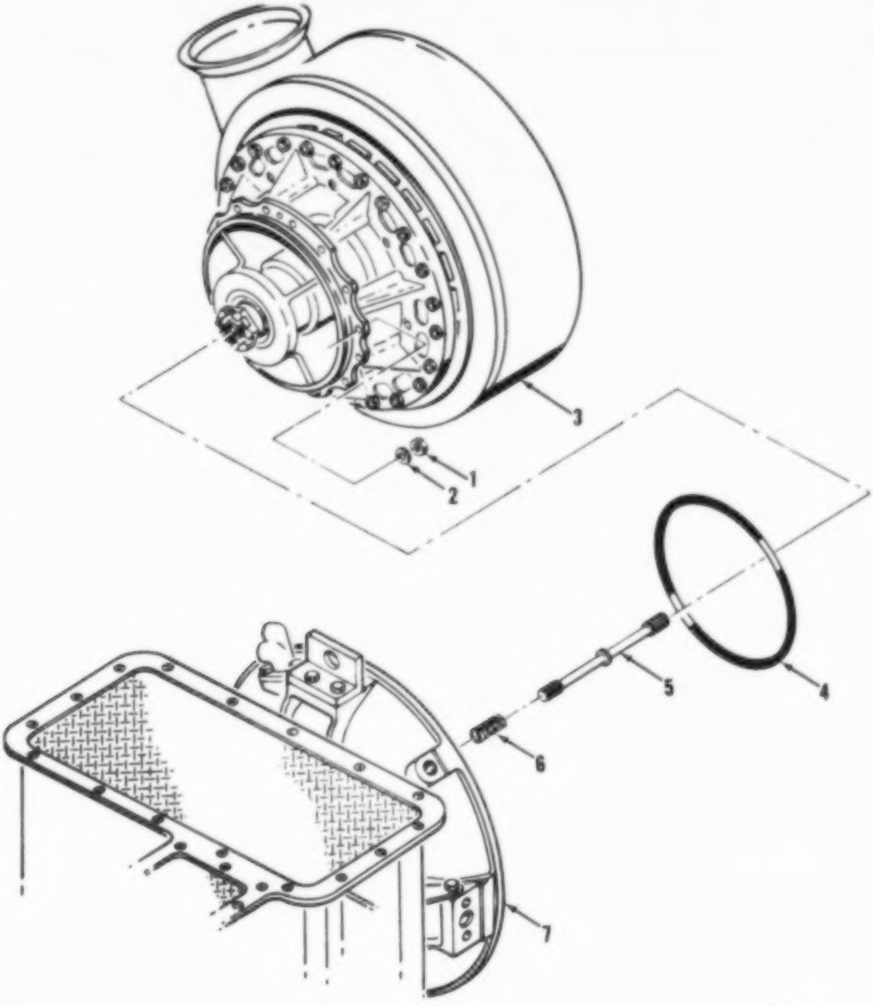
b. Removal. Remove the turbine assembly as follows:

(1) Remove muffler assembly, exhaust ejector assembly, exhaust pipe assembly, fuel atomizer assembly, igniter plug, combustor cap assembly, and combustion chamber assembly according to TM 5-6115-339-12.

(2) Remove gas turbine engine from enclosure according to paragraph 2-12. Remove thermostat according to paragraph 3-17. Remove thermocouple according to paragraph 3-18.

(3) Remove combustion assembly components according to paragraph 3-20.

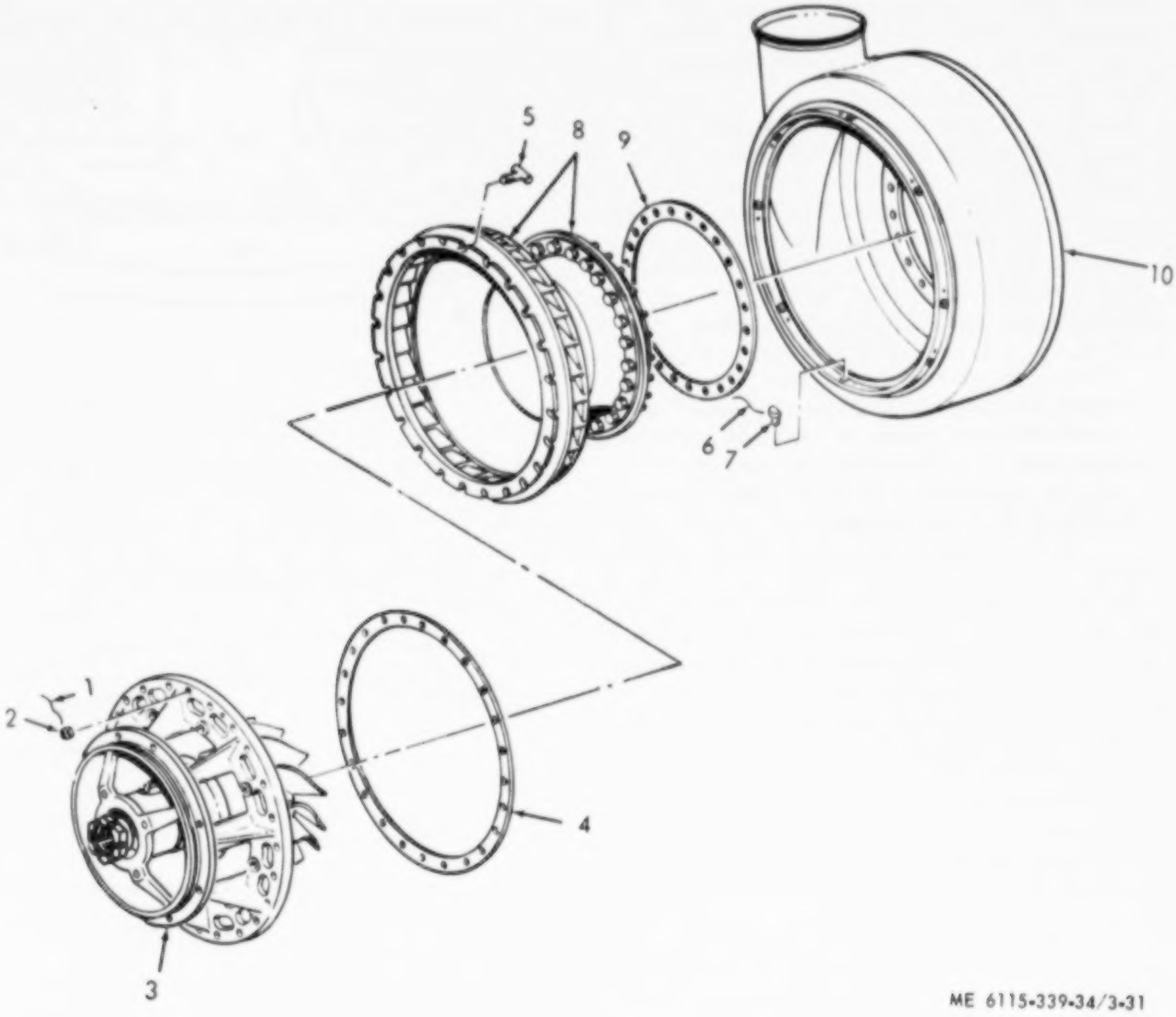
(4) Remove nuts (1, fig. 3-30) washers (2), and turbine assembly (3). Remove packing (4), shaft (5), and spring (6).



1. Nut
2. Washer
3. Turbine assembly
4. Packing
5. Shaft
6. Spring

Figure 3-30. Turbine assembly removal and installation.

c. Disassembly and Reassembly. Refer to figure 3-31 to disassemble and reassemble the turbine assembly.



1. Lockwire
2. Nut (24)
3. Turbine assembly
4. Nozzle box shim
5. Nozzle box attaching bolt (24)
6. Lockwire
7. Clevis pin (8)
8. Nozzle and shroud assembly
9. Gasket
10. Torus assembly

Figure 3-31. Turbine assembly disassembly and reassembly.

d. Inspection. Inspect components of the turbine assembly as follows:

(1) Dimensionally inspect shaft (5 fig. 3-30) in accordance with figure 3-32. Perform magnetic particle inspection of shaft.

(2) Visually inspect spring (6, fig. 3-30) for cracks. Inspect coil alinement by rolling spring across a smooth, flat surface. Inspect spring for a free length of 0.61 inch and a test length of 0.28 inch at a load of 3.0 ±0.5 pounds.

(3) Inspect torus assembly (10, fig. 3-31) for cracks and metal erosion. Thickness of metal must not be less than 0.020 inch in eroded areas.

(4) Inspect nozzle and shroud assembly (8, fig. 3-31) according to figure 3-33 and observing the following:

(a) Two shroud cracks (1) less than one-quarter inch apart on the same side of vane which could intersect and break off a segment of vane are not permissible.

(b) Maximum permissible vane cracks (2) on individual vanes are two cracks less than one-

quarter inch long, separated by one-quarter inch minimum, or three cracks less than one-eighth inch long separated by one-eighth inch minimum.

NOTE

When cracks exist as allowed in the preceding example, rotate nozzle assembly 120° from its initial position of assembly.

(c) Concentrations of small shroud cracks (3) are permissible on outer periphery of nozzle shroud.

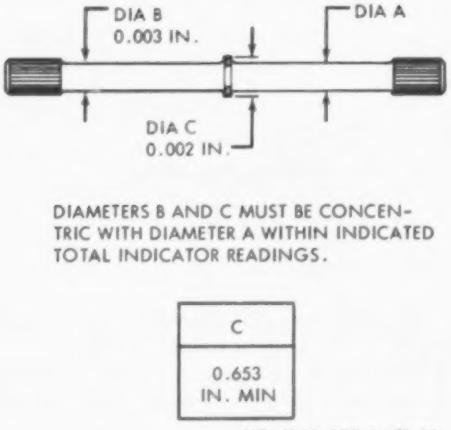
(d) Vane to shroud cracks (4) are permissible under one quarter inch length.

CAUTION

A vane to shroud crack may progress along the inside fillet until it joins a crack from an adjacent vane. Examine carefully for this possibility and reject nozzle assembly if this condition has occured or is in progress.

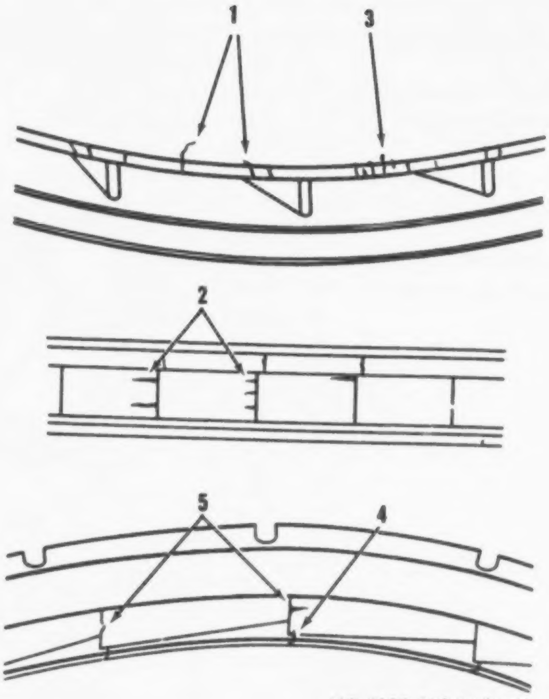
(e) Inner vane damage (5) from particles striking inner vane (trailing edge) is permissible if nicks, cracks, or dents do not exceed one-sixteenth inch in length; or one crack per vane, providing such damage is not at junction of shroud and vane.

(f) Inspect nozzle and shroud assembly flange bolts for damage and broken tack welds. Replace damaged bolts and repair broken welds. Bolt hole cracks are permissible as follows: No more than four cracked bolt holes are permissible. Cracks may extend to outer periphery but not into inner flange radius. Cracks bolt holes must be separated by a minimum of six holes.


DIA B
0.003 IN.
DIA A
DIA C
0.002 IN.
DIAMETERS B AND C MUST BE CONCENTRIC WITH DIAMETER A WITHIN INDICATED TOTAL INDICATOR READINGS.
C
0.653
IN. MIN

ME 6115-339-34/3-32

Figure 3-32. Inspection of turbine shaft.



ME 6115-339-34/3-33

1. Shroud cracks
2. Vane cracks
3. Small crack concentration
4. Vane to shroud cracks
5. Nicks, cracks, or dents

Figure 3-33. Inspection of nozzle and shroud assembly for cracks.

e. ***Repair.*** Replace all parts that inspection reveals as unsatisfactory.

f. ***Installation.*** Install turbine assembly in reverse order of removal using figure 3-30 as reference.

Section IV. ACCESSORY ASSEMBLY AND PLANETARY GEAR ASSEMBLY

3-22. General

This section contains repair instructions for the accessory assembly and the planetary gear assembly. The planetary gear assembly provides a reduction gear system to reduce high rpm output of the turbine to drive the accessory assembly. The accessory assembly provides gear systems for additional rpm reduction and drive of the various accessories mounted on the accessory assembly housing.

3-23. Accessory Assembly

a. General. The accessory assembly consists of an alloyed magnesium housing containing a reduction gear system to drive the fuel control unit, centrifugal switch assembly, cooling air fan assembly, oil pump assembly, tachometer generator and ac generator. The arrangement of the gear train is such that the starter motor assembly drives all accessories in addition to driving the compressor, turbine wheel and ac generator during the initial phase of starting. The accessory assembly housing provides mounting pads for the accessories and ac generator.

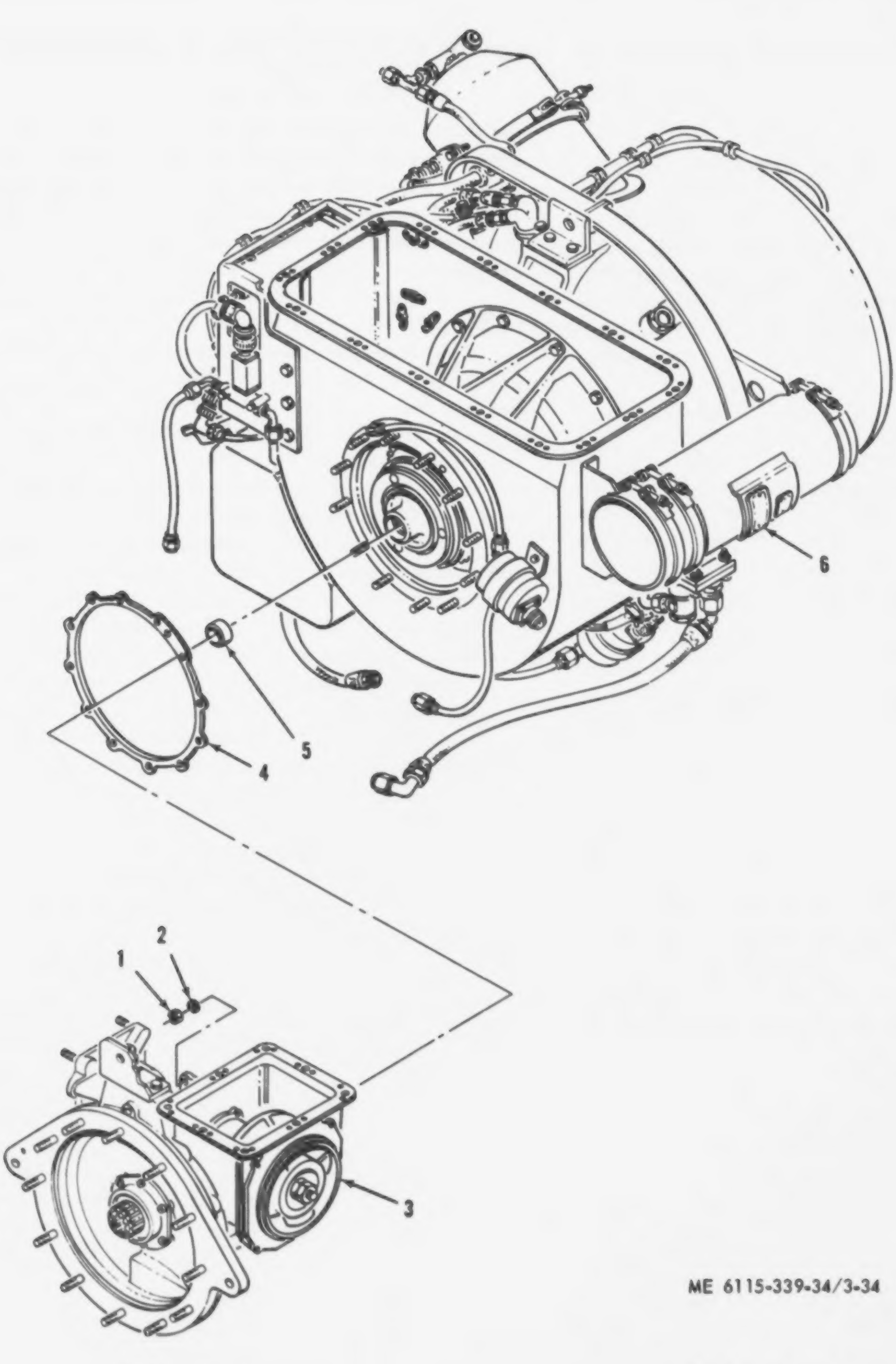
b. Removal. Remove accessory assembly as follows:

(1) Remove gas turbine engine and ac generator from enclosure as described in paragraph 2-12.

(2) Remove ac generator as described in paragraph 2-13.

(3) Remove starter motor assembly as described in paragraph 3-6.

(4) Remove fuel control unit as described in paragraph 3-7.



1. Nut (12)
2. Washer
3. Accessory assembly
4. Gasket seal plate
5. Bearing
6. Compressor and turbine assembly

Figure 3-34. Accessory assembly removal and installation.

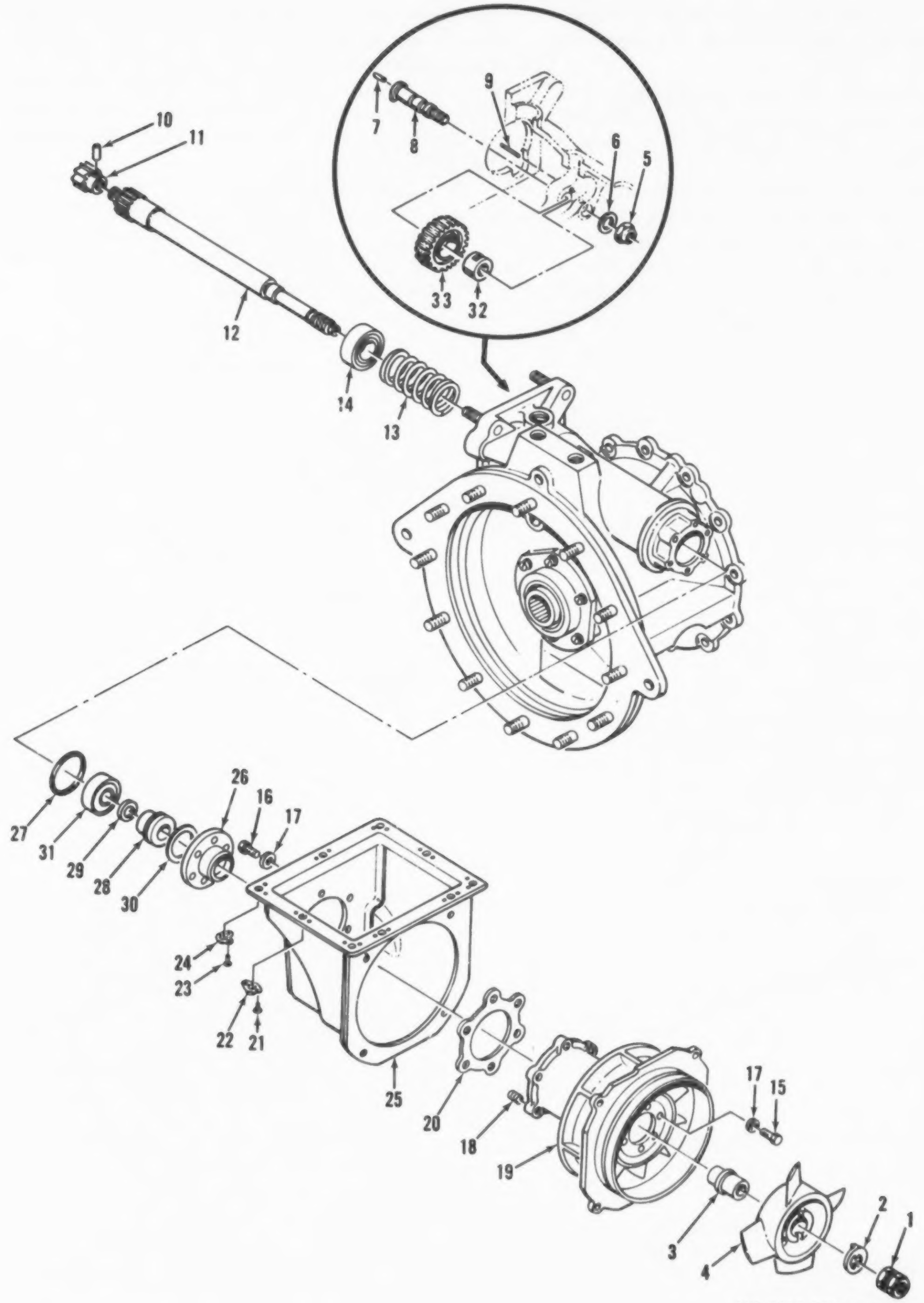
c. Disassembly and Reassembly. Refer to figure 3-35, to disassemble and reassemble the accessory drive assembly.

(1) Remove nut (1) and washer (2). Use mechanical fan puller to remove fan (4) and hub (3). Do not remove hub from fan unless damage is indicated by inspection.

(2) Remove nut (5) washers (6) and shaft (8). Install a ⅛ inch rod through bushing (32) to prevent gear (33) from dropping into interior of accessory case when pin (9) is removed. Use a magnet or long nose pliers to remove pin (9). Allow gear and bushing to drop down on installed rod to clear bearing, (14) when shaft (12) is removed. Tap lightly on end of shaft (12) with a plastic mallet, if necessary, to aid in loosening shaft for removal. Removal of pin (10) or jaw (11) from shaft (12) is not required unless damage is revealed by inspection. Remove spring (13) and bearing (14).

(3) Remove bolts (15, 16), washers (17), housing (19), gasket (20), and plenum (25).

(4) Remove retainer (26) and packing (27), press seal (28) from retainer (26). Remove washer (29), shims (30), and bearing (31).



ME 6115-339-34/3-35

Figure 3-35. Accessory assembly, disassembly and reassembly.

Key to figure 3-35:

1. Nut
2. Washer
3. Hub
4. Fan
5. Nut
6. Washer
7. Pin
8. Shaft
9. Pin
10. Pin
11. Pawl drive jaw
12. Fan drive shaft
13. Spring
14. Bearing
15. Bolt (6)
16. Screw (6)
17. Washer (12)
18. Insert
19. Vane housing
20. Gasket
21. Rivet (14)
22. Nut plate (7)
23. Rivet (8)
24. Nut plate (4)
25. Plenum assembly
26. Retainer
27. Packing
28. Seal
29. Washer
30. Shim
31. Bearing
32. Bushing
33. Gear

d. Cleaning. Clean components of the accessory assembly in an approved cleaning solvent.

e. Inspection. Inspect components of the accessory assembly as follows:

(1) Inspect all threaded parts for crossed, peened, or stripped threads. Threaded parts must turn freely in their matting parts without binding.

(2) Visually inspect all gears for grooved, chipped, or otherwise damaged gear teeth.

(3) Inspect tips of fan (4) for evidence of scoring caused by rubbing in housing (19). Inspect hub (3) for looseness in fan (4).

(4) Inspect shaft assembly (10, 11, 12, fig. 3-35) for indication of radial looseness between jaw (11) and shaft (12).

(5) Inspect spring (13), for coil alinement by rolling spring across a smooth flat surface. Inspect spring for a free length of 1.01 inches and a load length of 0.94 inch with 7.0 ± 0.7 pounds load.

(6) Inspect housing (19), for evidence of damage caused by rubbing of fan blade tips.

(7) Inspect plenum assembly (25), for cracks and secure installation of nutplates (22, 24).

f. Repairs. Replace all faulty components as required to restore accessory assembly to functional order.

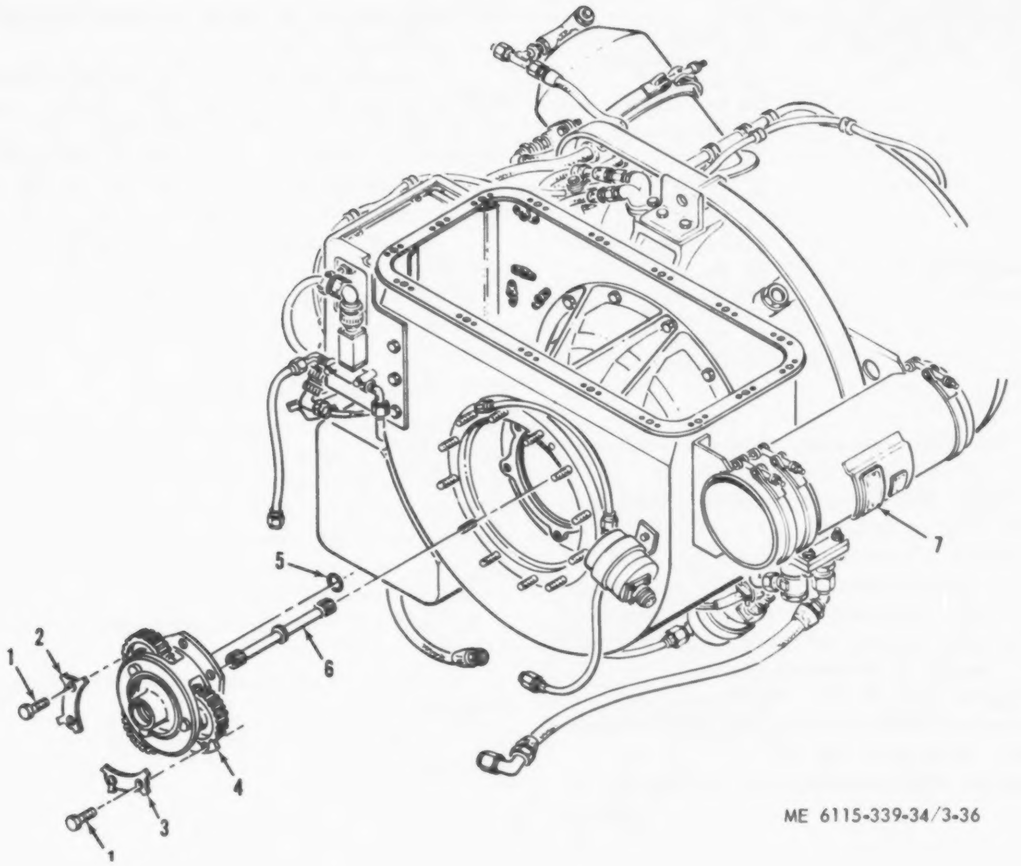
3-24. Planetary Gear Assembly

a. General. The planetary gear assembly consists of a planetary gear system supported in a carrier assembly and mounted on the compressor housing with an adapter. The planetary gear assembly reduces the high rpm output from the turbine assembly and transmits the shaft power to the accessory assembly gear train.

b. Removal. Remove planetary gear assembly as follows:

(1) Remove accessory assembly in accordance with paragraph 3-23.

(2) Refer to figure 3-36 and remove planetary gear assembly.



1. Bolt (6)
2. Key washer
3. Key washer
4. Gear assembly
5. Packing
6. Planetary drive quill shaft
7. Compressor and turbine assemblies.

Figure 3-36. Planetary gear assembly removal and installation.

c. Cleaning and Inspection.

(1) Clean parts of the planetary gear assembly in an approved cleaning solvent.

(2) Inspect threaded parts for stripped, peened, crossed or otherwise damaged threads. Inspect other parts for any indication of damage.

d. Installation. Install planetary gear assembly in reverse order of removal.

Section V. COMPRESSOR ASSEMBLY

3-25. General

The compressor assembly consists of a two stage centrifugal compressor which supplies compressed air to the combustion assembly. The compressor impellers are driven from the turbine assembly and enclosed by shroud and housing assemblies to direct the air flow from the first stage to the second and from the second stage to the turbine plenum. A diffuser assembly is provided to reduce air turbulence at the entrance to the turbine plenum.

3-26. Compressor Assembly

a. Removal.

(1) Remove gas turbine engine according to paragraph 2-12.

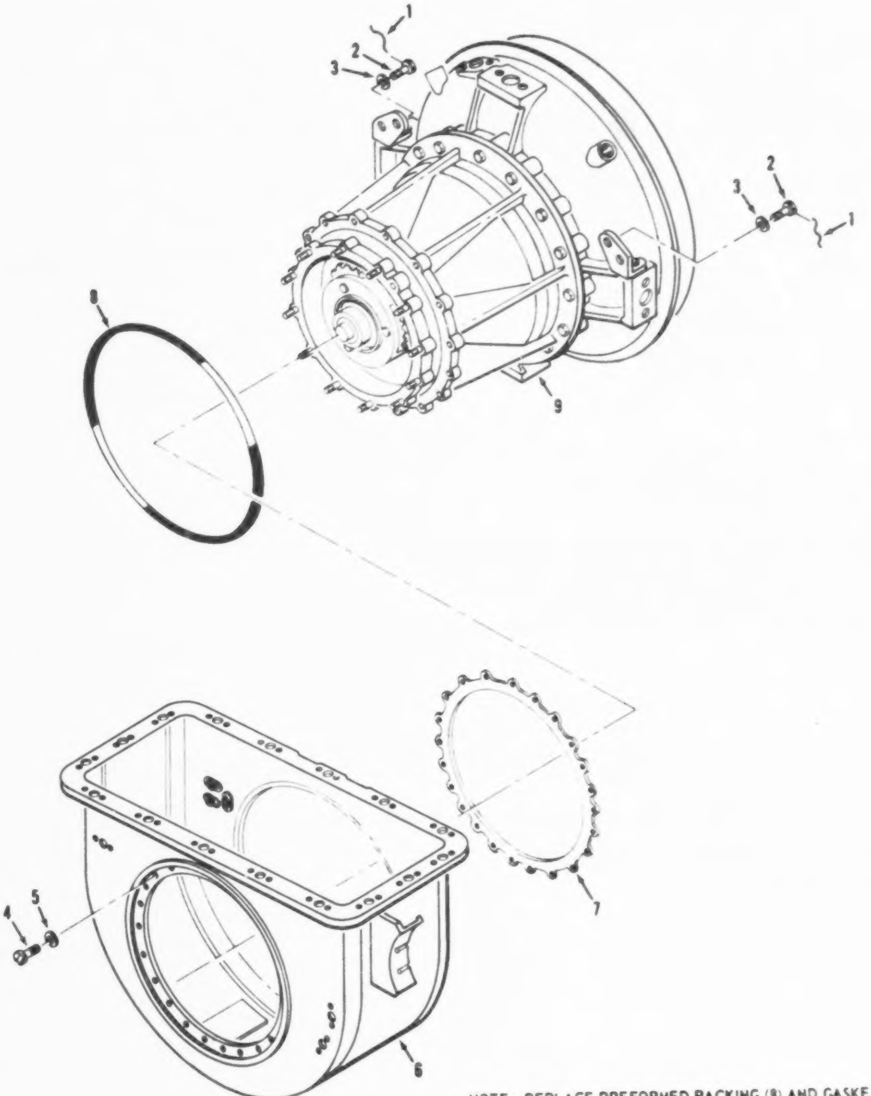
(2) Remove ac generator according to paragraph 2-13.

(3) Remove turbine assembly according to paragraph 3-21.

(4) Remove accessory assembly according to paragraph 3-23.

(5) Remove planetary gear assembly according to paragraph 3-24.

(6) Refer to figure 3-37 and remove the compressor assembly.



NOTE: REPLACE PREFORMED PACKING (8) AND GASKET (7) WHENEVER PLENUM ASSEMBLY OR COMPRESSOR ASSEMBLY ARE REMOVED.

ME 6115-339-34/3-37

1. Lockwire
2. Bolt (4)
3. Washer (4)
4. Screw (24)
5. Washer (24)
6. Compressor inlet plenum
7. Gasket
8. Preformed packing
9. Compressor assembly

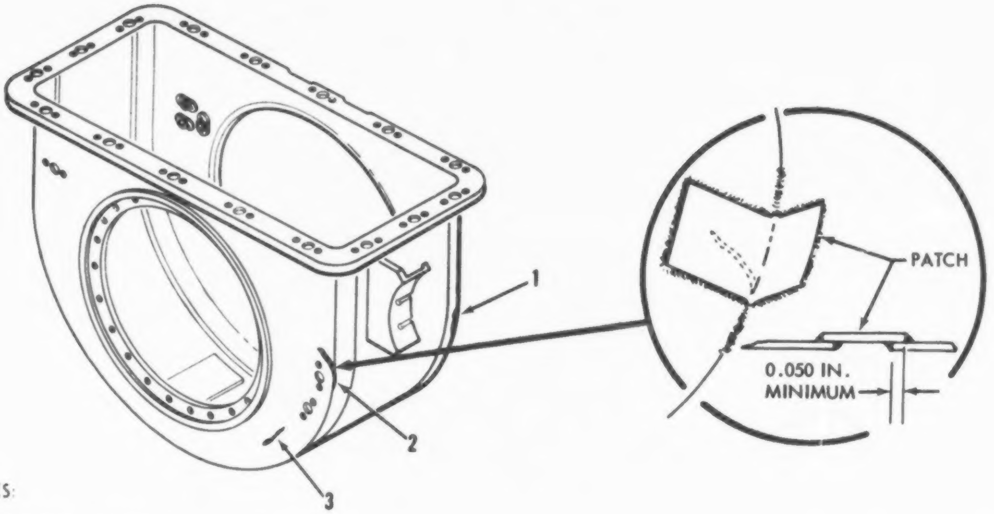
Figure 3-37. Compressor removal and installation.

c. Cleaning and Inspection.

(1) Clean the compressor assembly and inlet plenum with an approved cleaning solvent and dry thoroughly.

(2) Inspect all parts for nicks, burrs, cracks (particularly at weld points), and any other damage, which might affect the function of the part.

(3) Repair the compressor inlet plenum by welding as shown in figure 3-38.



NOTES:

A. WELD PER TM 9-237.
B. CLEAN AND REWELD ANY CRACK SUCH AS ITEM 1.
C. CRACKS SUCH AS ITEM 2 AND 3 REQUIRE PATCHES.
D. MINIMUM PATCH THICKNESS 0.023 INCH.
E. DO NOT OVERLAP PATCHES.
F. REMOVE ENOUGH MATERIAL TO ELIMINATE ALL TRACES OF CRACK.
G. ITEMS 1, 2, AND 3 ARE TYPICAL OF THE TYPES OF CRACKS, BUT DO NOT INDICATE LOCATIONS WHERE CRACKS MAY APPEAR.
H. ALL PATCHES ARE TO BE WELDED ON OUTER SKIN.
J. MATERIAL ALUMINUM ALLOY 6061-T4 PER SPECIFICATION QQ-A-327.

ME 6115-339-34/3-38

1. Crack in weld seam
2. Crack in weld seam and adjoining material
3. Crack in material

Figure 3-38. Compressor inlet plenum repair.

d. Installation. Install the compressor assembly in the reverse order of removal.

CHAPTER 4

REPAIR OF ELECTRICAL SYSTEM

Section I. AC GENERATOR AND VOLTAGE REGULATOR

4-1. AC Generator

a. General. The ac generator is a 60 KW, 0.8 power factor, 8-pole, 3-phase, 400 hertz, 120 / 208 or 240 / 416 volts, 416 volts, 6000 rpm, self-ventilated unit. Rotation is clockwise, as viewed from the outboard end.

b. Removal.

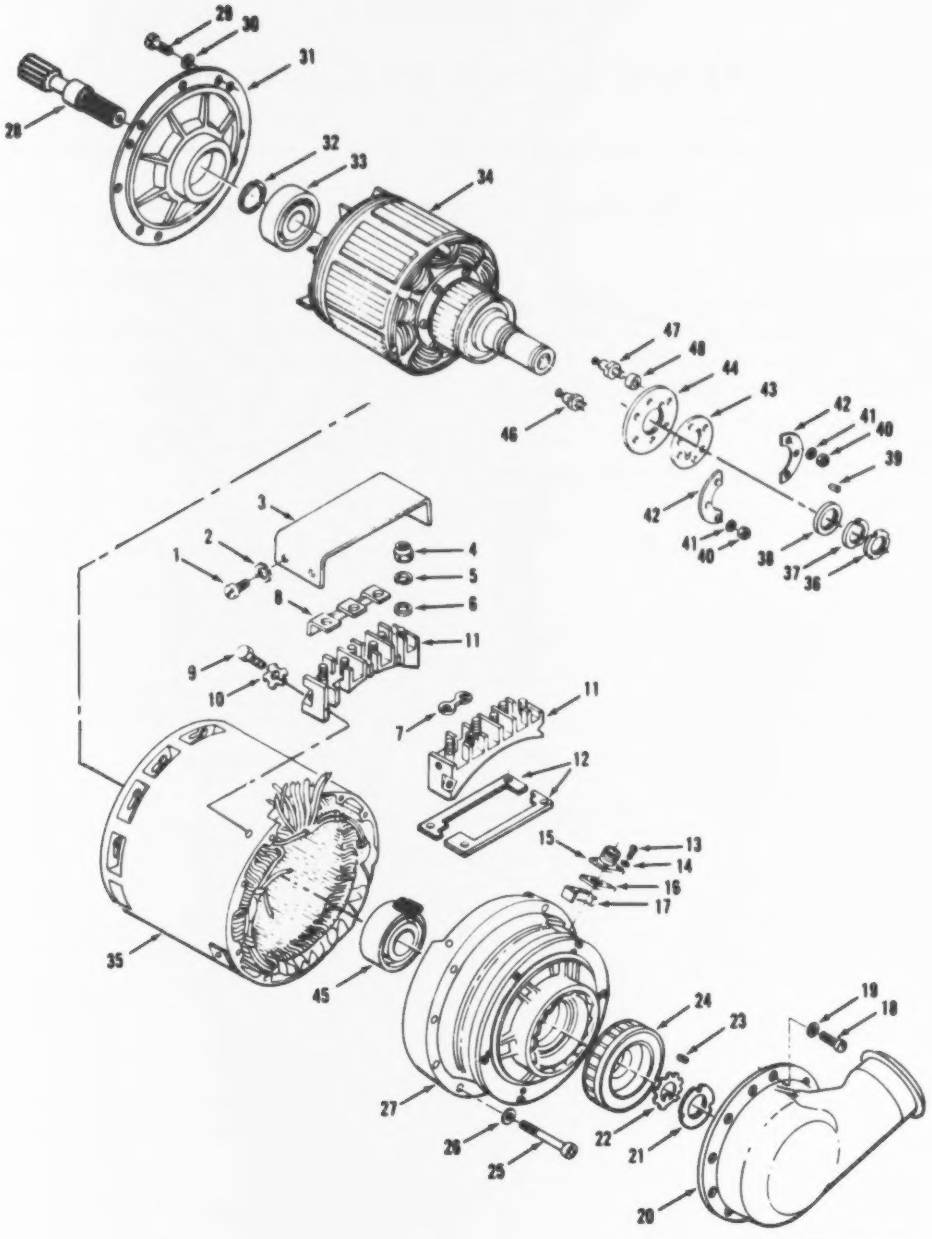
(1) Remove engine and generator as described in paragraph 2-12.

(2) Remove generator as described in paragraph 2-13.

c. Disassembly and Reassembly. Refer to figure 4-1 to disassemble and reassemble the generator.

NOTE

Disassemble the generator only to the extent required to replace a defective component.



ME 6115-339-34/4-1

1. Screw (4)
2. Washer (8)
3. Cover
4. Nut (12)
5. Washer (12)
6. Washer (12)
7. Connector (6)
8. Connector
9. Bolt (4)
10. Washer (4)
11. Block (2)
12. Insulation (2)
13. Screw (4)
14. Washer (4)
15. Connector
16. Washer
17. Sleeving
18. Screw (10)
19. Washer (10)
20. Air inlet
21. Nut
22. Washer
23. Key
24. Rotor
25. Screw (10)
26. Washer (10)
27. Shield assembly
28. Shaft
29. Screw (8)
30. Washer (8)
31. Support
32. Ring
33. Bearing
34. Armature and rotor assembly
35. Stator assembly
36. Nut
37. Nut
38. Washer
39. Pin
40. Nut (6)
41. Washer (6)
42. Ring
43. Insulation
44. Holder and nut assembly
45. Bearing
46. Rectifier
47. Rectifier
48. Bushing (6)

Figure 4-1. AC generator disassembly and reassembly.

d. Cleaning and Inspection.

(1) Clean the generator and components with a clean paint brush moistened in an approved cleaning solvent. Dry thoroughly.

CAUTION

Avoid harsh or brisk rubbing on varnished parts and do not soak components containing windings as solvents may tend to soften the varnish.

(2) Visually inspect all parts for defects such as cracks, broken or loose connections, stripped threads, and excessive or abnormal wear.

e. On-Unit Test (fig. 4-2).

(1) Remove all connectors from generator.

(2) Use an impedance bridge and check for 0.0220 to 0.0244 ohms between terminals T1 and T4, T2 and T5, T3 and T6, T7 and T10, T8 and T11, and T9 and T12. Use the impedance bridge to check for 13.2—14.7 ohms between terminals D and F; and 0.895—0.995 ohms between terminals A and B:

(3) Reconnect leads to generator and install electrical connector.

(4) Start generator set and run at governed speed.

(5) Adjust generator for no-load, 208 volts, line-to-line.

(6) Use a multimeter set at the appropriate range to check for 0175 ampere.

(7) Disconnect wire number V50A18 from TB4-4 and connect to the negative lead from the multimeter. Connect the positive lead of the multimeter to terminal 4 of TB4. Current shall not exceed 0.75 ampere.

(8) Adjust generator for full load, 208 volts line-to-line.

(9). Use multimeter set at the appropriate range to check for 1.3 amperes.

(10) Repeat step (7) above. Current shall not exceed 1.3 amperes.

(11) Shut down generator set and disconnect all leads from the generator.

(12) Place one probe of an insulation tester on ground and the other to T1 of generator. Set tester for 500 vac.

(13) Energize tester and observe indicator light on tester for leakage indication. Repeat test for T2, T3, T7 through T9 pins F and B of connector P7

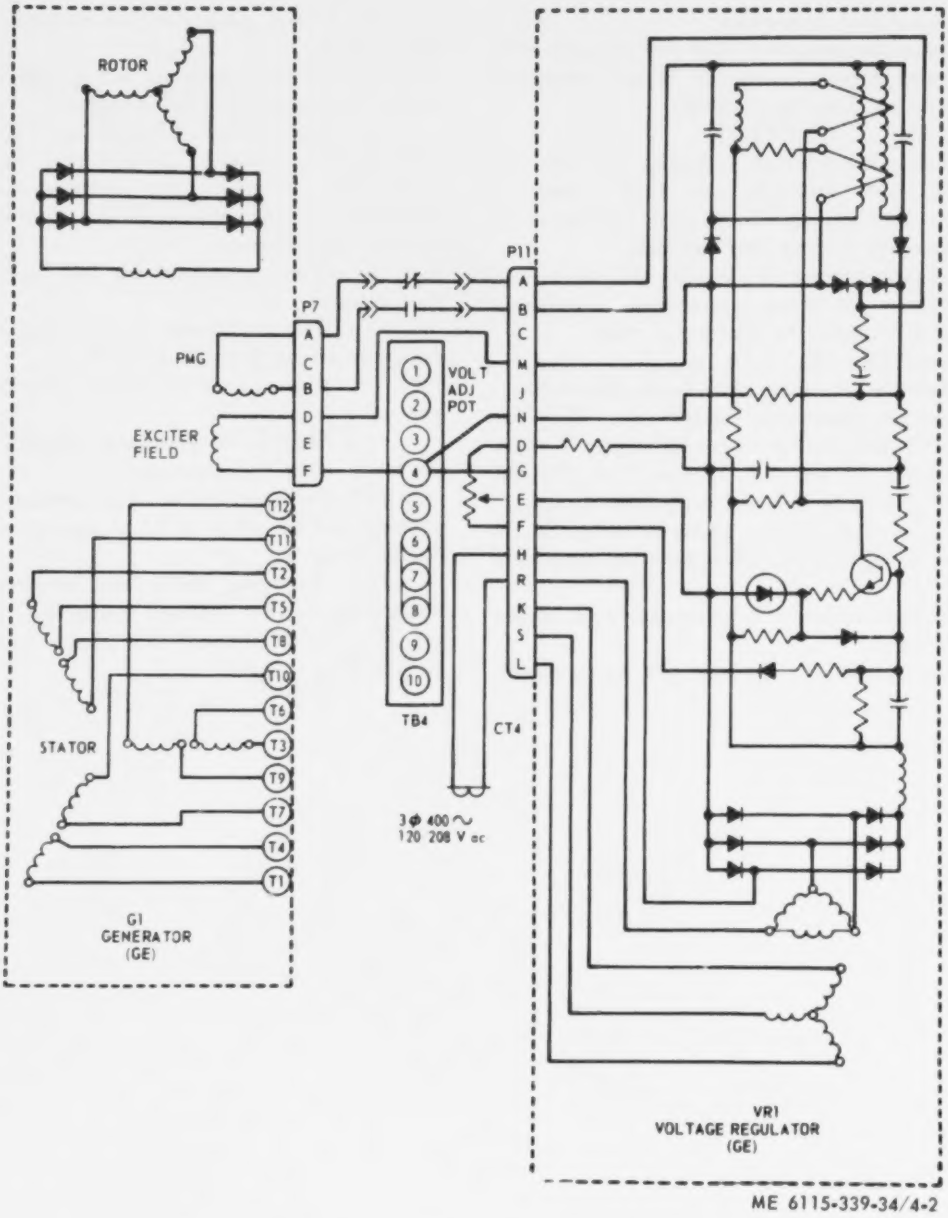


Figure 4-2. AC generator testing, schematic diagram.

4-2. Voltage Regulator

a. General. The voltage regulator regulates the ac generator, maintaining a constant output voltage by varying the exciter field current to the exciter assembly. It is located within the enclosure at the top front, right side.

b. Removal (fig. 4-5).

(1) Remove the electrical connector (P11).

(2) Remove attaching hardware and wiring.

(3) Remove voltage regulator assembly.

c. Cleaning and Inspection.

(1) No cleaning is necessary other than to remove any accumulation of dirt and dust, preferably by blowing it out with moisture free compressed air.

(2) Inspect voltage regulator for screws or washers that may have become loose from vibration. Check for dents or cracks on cover.

d. Disassembly. This assembly should not be disassembled any further than is necessary to replace a known defective component. All components are accessible after removal of the top cover.

4-3. General

The ac electrical system components in this section consists of the ac wiring harness, governor-load anticipation control, current transformers (CT1, CT2, CT3 and CT4), voltage change and distribution panel (TB5), ac output panel (TB7), terminal board (TB4), overcurrent relay (K14), and main circuit breaker (CB3).

4-4. Generator Set Ac Wiring Harness

a. General. The ac wiring harness is a part of the generator set branched wiring harness assembly. Its main function is to carry alternating current to and between terminal boards TB4 and TB5, voltage regulator, load anticipator, current transformers, remote control receptacle, convenience receptacle, main circuit breaker, overcurrent relay, ac output panel, and ac generator.

b. Removal. To remove wiring harness, refer to figure 4-3 and observe the following.

(1) Tag and disconnect all electrical leads.

(2) Tag and disconnect all electrical connectors.

(3) Loosen or remove cable clamps and / or straps, noting their location and position.

c. Cleaning. Clean the harness by wiping with a cloth moistened with an approved cleaning solvent. Dry thoroughly.

WARNING

Many cleaning fluids are inflamable and / or toxic. For the safety of personnel and property, care must be taken to protect the skin and eyes, to avoid exposure to flames or sparks, and to assure adequate ventilation when solvents are used. Do not inhale fumes as this can be seriously detrimental to health of life.

d. Inspection. Inspect for evidence of damage, excessive wear, cracks, stripped threads or loose pins on connectors, or burned areas from shorting.

e. Repair.

(1) Replace any damaged electrical connectors, terminals, or insulation sleeving.

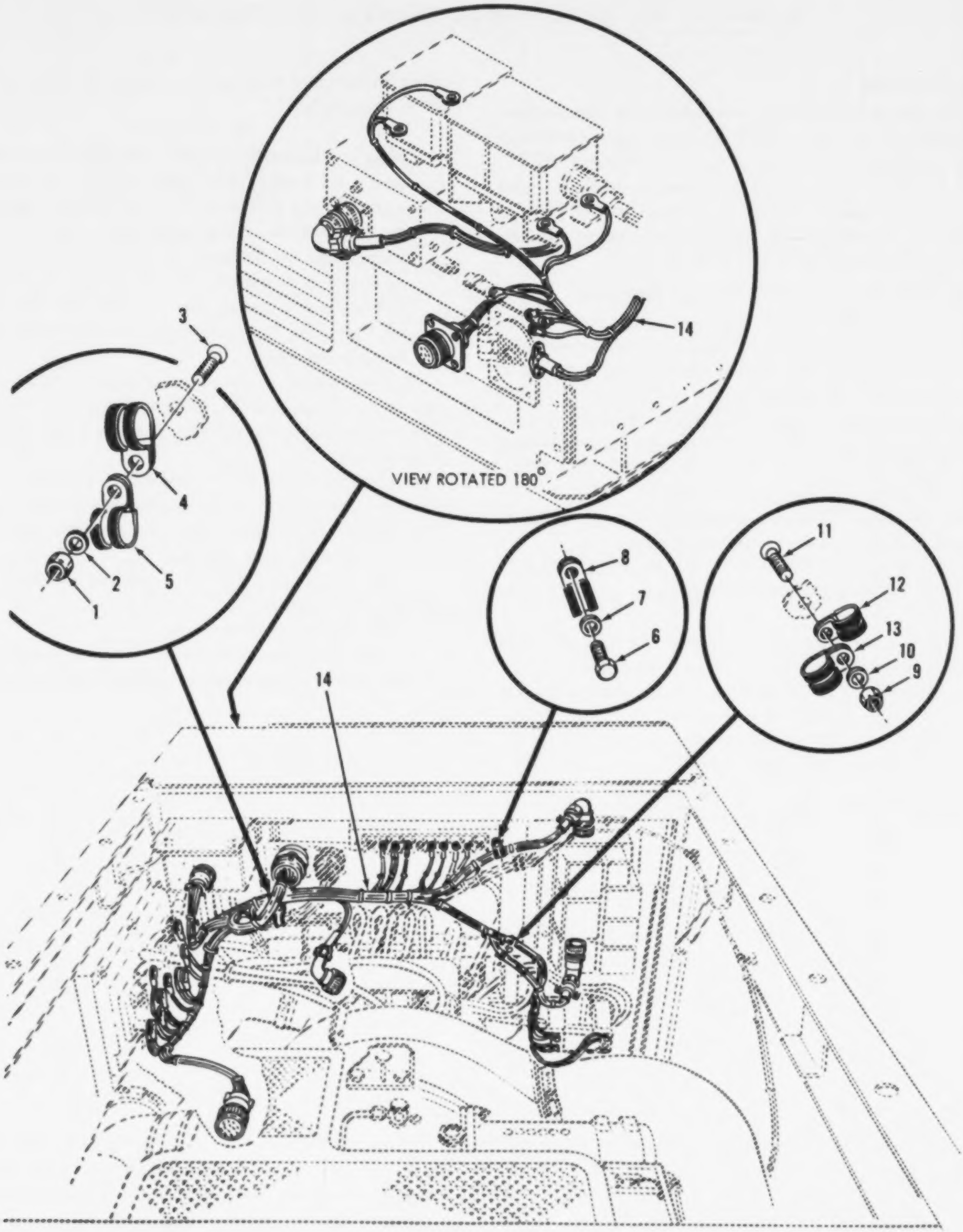
(2) Refer to figure 4-4 wire location chart, and replace all defective wires.

(3) Wrap and tie all junctions worked, with appropriate cable tie.

(4) Solder connections.

f. Installation. Install the wiring harness in reverse order of removal procedure, using figure 4-3.

best copy available



ME 6115-339-34/4-3

1. Nut, self-locking
2. Washer
3. Screw
4. Clamp
5. Clamp
6. Bolt
7. Washer
8. Clamp
9. Nut
10. Washer
11. Screw
12. Clamp
13. Clamp
14. Wiring harness

Figure 4-3. AC wiring harness removal and installation.

FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)	FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)
A2-L1	S11-1	X71A18	18	White	51.0	K12-A3	J1-Z	X137B18	18	White	AR
A2-L2	S11-2	X69A18B	18	White	50.0	K12-C2	J1-b	X55B18	18	White	AR
A2-L3	S11-9	X70A18	18	White	47.0	K12-C3	J1-c	X136B18	18	White	AR
A2-Neg	M10-Neg	D76A18	18	White	52.0	K16-C2	R11-1	X118C18	18	White	8.0
A2-N1	K11-N	X22X18N	18	White	16.0	K7-B2	S12-3	X90A18C	18	White	50.0
A2-N2	A2-N1	X22V18N	18	White	4.0	MT-1	J1-0	X38D18A	18	White	19.0
A2-N3	A2-N2	X22W18N	18	White	4.0	MT-1	A2-V1	X38E18A	18	White	31.0
A2-Pos	M10- Pos	D75A18	18	White	52.0	MT-2	TB1-6	X22Y18N	18	White	7.0
A2-S1	J1-j	V72A18	18	White	25.0	MT-2	K7-X2	X22Z18N	18	White	10.0
A2-S2	J1-z	V73A18	18	White	24.0	M7-1	S11-H	D98A18	18	White	7.0
A2-S3	J1-m	V74A18	18	White	23.0	M7-2	S11-D	D97A18	18	White	6.0
DS8-1	R4-2	L96A18A	18	White	9.0	M8-Neg	M1-Neg	D80A18	18	White	44.0
J1-A	**R9-1**	**X120B18A**	18	White	**AR**	M8-Pos	MT-Pos	D81A18	18	White	44.0
J1-B	R10-1	X119A18	18	White	18.0	M9-1	S11-4	D103A18	18	White	8.0
J1-C	R11-1	X118A18	18	White	18.0	R1-CCW	J1-M	V58B18	18	White	36.0
J1-D	K16-A1	X117A18	18	White	23.0	R1-S	J1-N	V95B18	18	White	36.0
J1-E	K16-B1	X116A18	18	White	23.0	R10-1	K16-B2	X119C18	18	White	8.0
J1-F	K16-C1	X115A18	18	White	23.0	R10-2	K16-B3	X47B18B	18	White	8.0
J1-H	S3-9	V12A18	18	White	35.0	R10-2	K11-L2	X47H18B	18	White	30.0
J1-J	R1-CW	V13A18	18	White	38.0	R11-2	K16-C3	X39L18C	18	White	8.0
J1-K	S12-1	X14C18C	18	White	45.0	R11-2	K11-L3	X39K18C	18	White	30.0
J1-P	A2-V3	X39C18C	18	White	36.0						
J1-R	S12-12	X107A18	18	White	43.0						
J1-S	S12-14	X108A18	18	White	44.0						
J1-T	S12-13	X109A18	18	White	43.0						
J1-V	K7-X1	X48C18B	18	White	21.0	R2-2	DS7-1	L62A18C	18	White	16.0
J1-X	S12-8	X51C18	18	White	45.0	R3-1	S12-3	X90B18C	18	White	12.0
J1-Y	S12-7	X52C18	18	White	45.0	R3-2	R2-1	X61A18C	18	White	3.0
J1-d	DS7-2	L63F18C	18	White	44.0	R3-2	K7-B3	X61B18C	18	White	40.0
J1-e	DS8-2	L65F18A	18	White	33.0	R5-2	R4-1	X64A18A	18	White	3.0
J1-f	S11-A	X66C18A	18	White	34.0	R5-2	K7-A3	X64B18A	18	White	43.0
J1-g	S11-B	X67C18B	18	White	34.0	R7-CCW	S12-7	X52E18	18	White	45.0
J1-h	S11-C	X68C18C	18	White	39.0	R7-CW	S12-8	X51D18	18	White	45.0
J1-n	R6-CCW	X91A18	18	White	8.0	R7-S	R7-CCW	52D18	18	White	3.0
J1-p	R6-S	X92A18	18	White	8.5	R8-CCW	J1-G	V36D18	18	White	AR
J1-q	R6-CW	X93A18	18	White	9.0	R8-CW	TB1-6	X22AL18N	18	White	AR
J1-r	A2-V2	X47E18B	18	White	23.0	R5-S	J1-L	V37A18	18	White	AR
						K16-A2	**R9-1**	**X120C18A**	18	White	**AR**
J1-u	TB1-6	X22T12N	12	White	18.0	R9-2	K16-A3	X38J18A	18	White	**8.0**
J1-v	S3-12	V101A18	18	White	35.0	S11-A	S11-G	X66D18A	18	White	8.0
K10-L1	**A2-V1**	X38F18A	18	White	15.0	S11-B	S11-E	X67D18B	18	White	4.0
K10-L1	K11-L1	X38G18A	18	White	22.0	S11-F	S11-C	X68D18C	18	White	8.0
K10-L2	A2-V2	X47F18B	18	White	15.0	S11-F	S11-K	X68E18C	18	White	6.0
K10-L2	K11-L2	X47G18B	18	White	14.0	S11-N	S11-9	X22AE18N	18	White	6.0
K10-L3	A2-V3	X39H18C	18	White	15.0	S11-N	M9-2	D22AD18N	18	White	8.0
K10-L3	K11-L3	X39J18C	18	White	14.0	S11-2	S11-7	X69B18B	18	White	3.0
K11-L1	**R9-2**	X38H18A	18	White	30.0	S11-3	S11-8	X70B18	18	White	3.0
K12-A2	J1-W	X57B18	18	White	AR	S11-5	S11-9	X22AF18N	18	White	3.0

ME 6115-339-34/4-4 ①

Figure 4-4. Wiring harness assembly wire location. (Sheet 1 of 2).

FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)	FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)
S11-6	S11-1	X71B18	18	White	4.0	S12-6	J1-y	X32C18A	18	White	43.0
S12-10	S12-15	X22AB18N	18	White	4.0	S3-10	R1-CCW	V58A18	18	White	13.0
S12-10	TB1-6	X22AA18N	18	White	47.0	S3-11	J1-Q	V59A18	18	White	33.0
S12-15	M9-2	X22AC18N	18	White	21.0	S3-7	R1-S	V95A18	18	White	12.0
S12-5	K7-A2	X94B18A	18	White	52.0	S3-8	J1-w	V60B18	18	White	33.0
S12-5	R5-1	X94A18A	18	White	14.0	TB1-6	K11-N	X22U18N	18	White	23.0

ME 6115-339-34/4-4 ②

Figure 4-4. Wiring harness assembly wire location. (Sheet 2 of 2).

4-5. Wire Assemblies

a. General. Various wire assemblies covered in this paragraph connect components of the ac electrical system and are illustrated in various figures to show relationship. They consist mainly of the wire assemblies connecting the ac generator (G1), voltage change panel (TB5), overcurrent relay (K14), ac power output panel (TB7), and main circuit breaker (CB3).

b. Removal. To remove the wire assemblies, tag each end for identification, disconnect from components, loosen or remove clamps, fairleads or straps, noting their location and position.

c. Cleaning. Clean wire assemblies by wiping with a clean cloth moistened with an approved cleaning solvent.

d. Inspection. Inspect wire assemblies for loose or damaged terminal lugs, evidence of insulation damage through short circuits, overheating, and chaffing from rubbing or vibration.

e. Testing. Test wire assemblies from terminal to terminal with a multimeter for continuity.

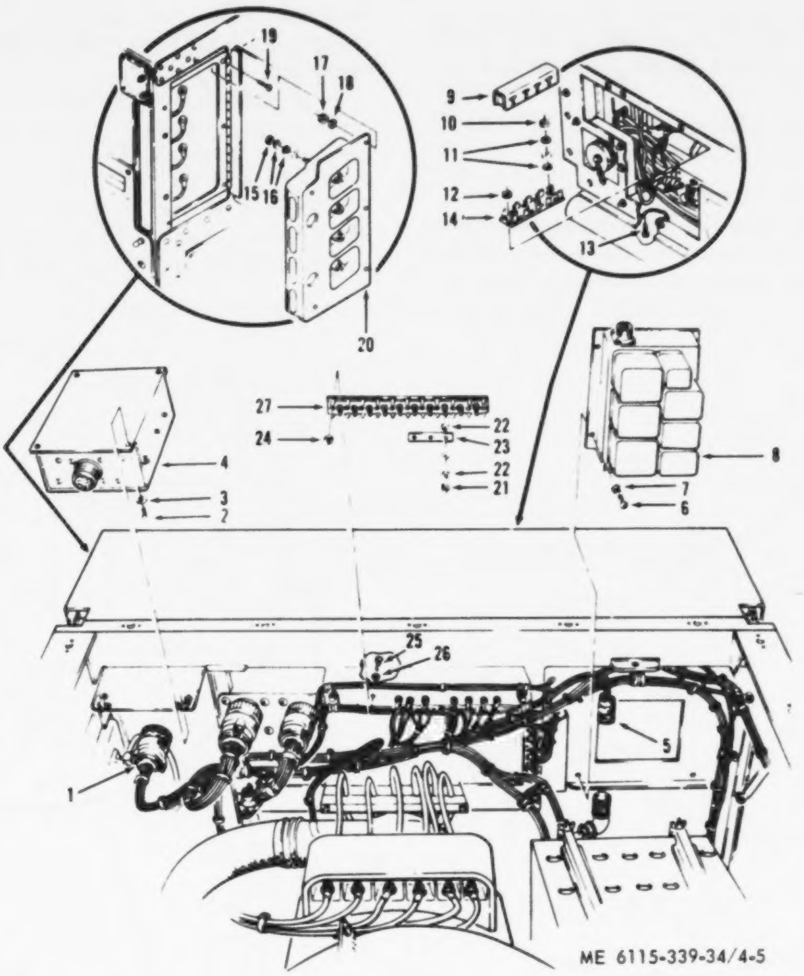
f. Repair. Replace any terminals, connectors, or wire assemblies found defective.

g. Installation. Install wire assemblies in reverse order of removal procedure.

4-6. Governor-Load Anticipation Control

a. General. The governor-load anticipation control is mounted within the enclosure on the top left side. The control senses the generator output and sends a signal to the control motor to adjust the fuel flow to maintain a constant frequency output from the generator.

b. Removal and Installation. Refer to figure 4-5 to remove and install the governor load anticipation control.



1. Electrical connector (P11)
2. Screw (4)
3. Washer (4)
4. Voltage regulator
5. Electrical connector
6. Screw (4)
7. Washer (4)
8. Load anticipator
9. Protective cover
10. Nut (2)
11. Washer (8)
12. Nut (2)
13. Screw (2)
14. Terminal board (TB8)
15. Nut (4)
16. Washer (8)
17. Nut (5)
18. Washer (5)
19. Screw (5)
20. Terminal board (TB 7)
21. Nut (10)
22. Washer (20)
23. Bus bar (2)
24. Nut (2)
25. Screw (2)
26. Washer (2)
27. Terminal board (TB 4)

Figure 4-5. Voltage regulator, load anticipator and terminal boards removal and installation.

c. Cleaning and Inspection.

(1) Clean by blowing off with compressed air under low pressure and removing grease, oil, etc, with a clean cloth moistened in an approved cleaning solvent.

(2) Inspect for evidence of damage, stripped threads and loose electrical connections.

4-7. Terminal Boards

a. General. The terminal boards provide an electrical interconnection for the wiring harness and components.

b. Removal and Installation. Refer to figure 4-5 to remove and install the terminal boards.

c. Cleaning and Inspection.

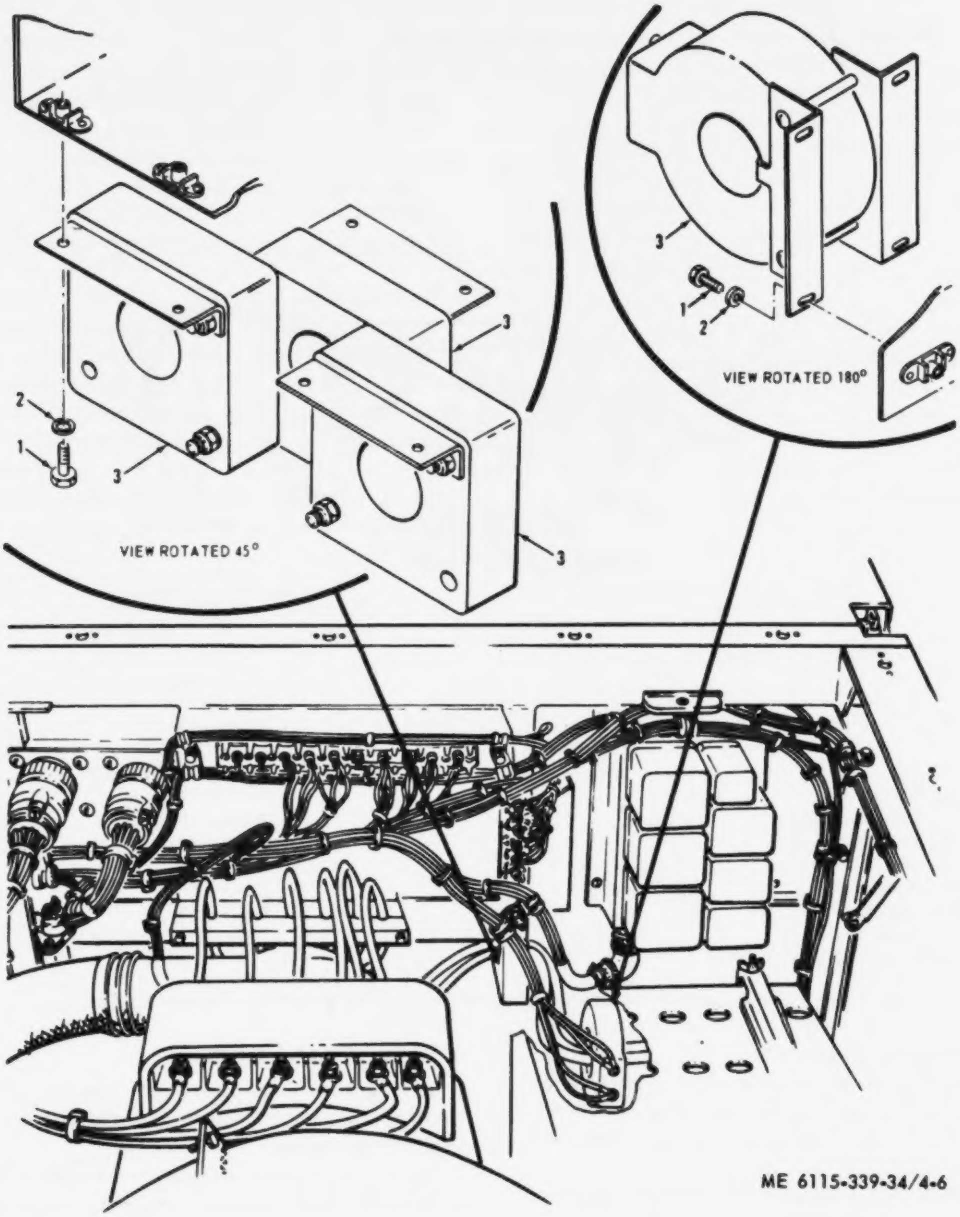
(1) Clean terminal board with a clean cloth moistened in an approved cleaning solvent and dry thoroughly.

(2) Inspect for evidence of damage, cracks, stripped threads, and loose connections.

4-8. Current Transformers

a. General. There are four current transformers located to the right and below the governor-load anticipation control within the enclosure. Current transformers CT1, CT2, and CT3 work in conjunction with the governor-load anticipation control, CT4 works in conjunction with the voltage regulator.

b. Removal. To remove current transformers, disconnect generator wire assemblies from generator terminals T1 and T7 (for CT1 and CT4), T9 and T3 (for CT3), and T2 and T8 (for CT2), and wiring harness leads from current transformers. Tag electrical leads for identification and remove in accordance with figure 4-6.



1. Bolt (10)
2. Washer (10)
3. Current transformer (4)

Figure 4-6. *Current transformer removal and installation.*

c. Cleaning and Inspection.

(1) Clean by blowing foreign matter loose with dry compressed air at low pressure and wiping oil or grease off with a clean cloth moistened in an approved cleaning solvent. Dry thoroughly.

(2) Inspect for evidence of damage, shorting, loose connections, or excessive overheating. Replace a defective transformer.

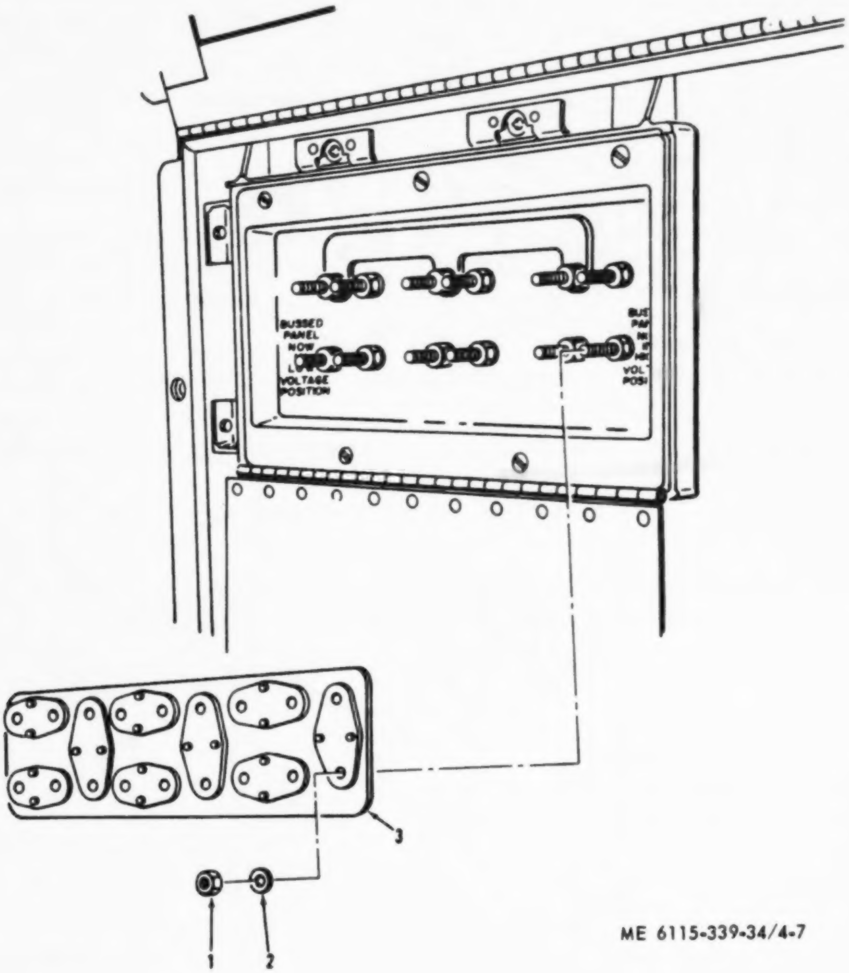
d. Testing. Test for continuity or opens using a multimeter set on the ohms scale.

e. Installation. Install current transformers in reverse order of removal.

4-9. Voltage Change Panel Assembly

a. General. The voltage change panel assembly is connected to the ac generator windings. Through wiring assemblies and terminal studs. The panel is used to select either 120 / 208 volts or 240 / 416 volts generator output.

b. Removal and Installation. Refer to figure 4-7 to remove and install the voltage change panel assembly.



1. Nut (12)
2. Washer (12)
3. Voltage change panel assembly

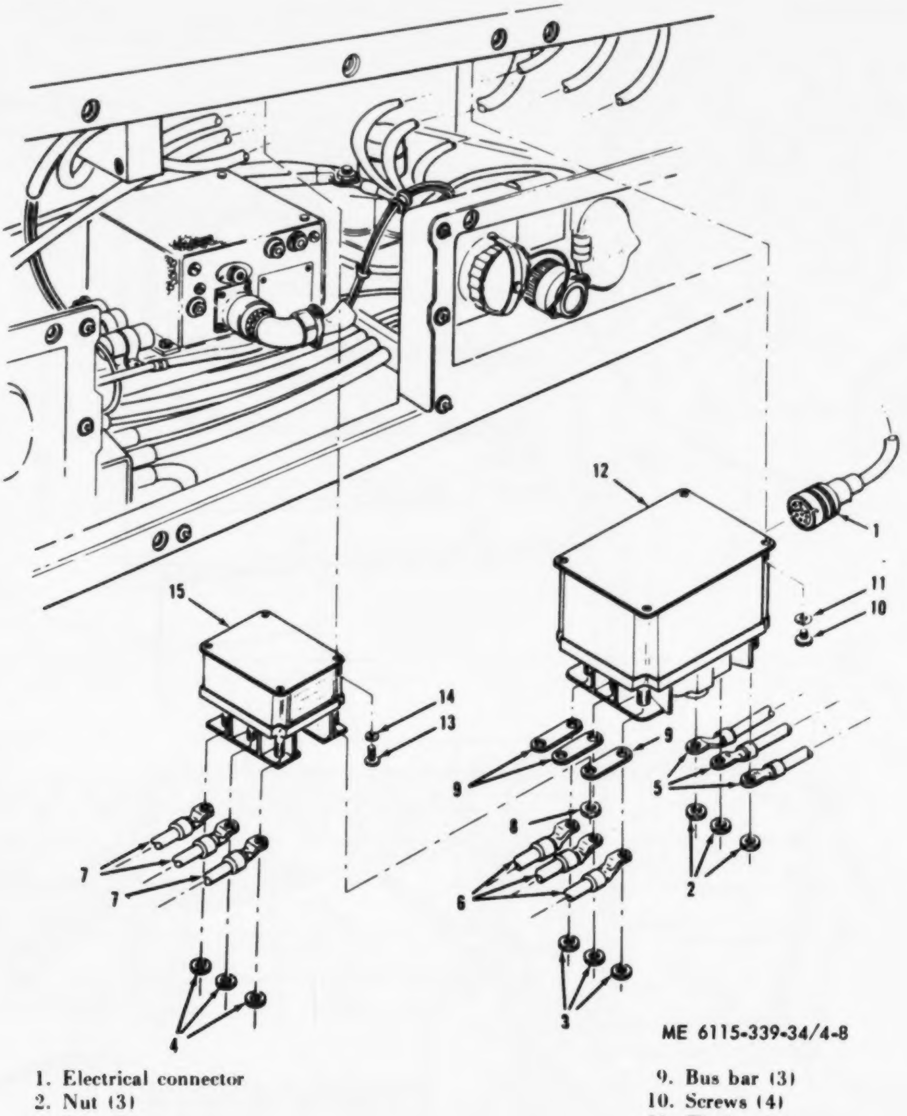
Figure 4-7. Voltage change panel assembly removal and installation.

4-10. Overcurrent Relay (K14) and Main circuit Breaker (CB3)

a. *General.* The overcurrent relay and the main circuit breaker are generator protective components located in the lower right front of the enclosure. The overcurrent relay is directly connected to the main circuit breaker through three bus bars. The relay is adjustable.

b. *Removal.* Refer to figure 4-8 and proceed as follows to remove the overcurrent relay and the main circuit breaker.

(1) Remove electrical connector (1).
(2) Remove nuts (2), (3), and (4).
(3) Tag and remove electrical leads (5), (6), and (7).
(4) Remove nuts (8) and bus bars (9).
(5) Remove screws (10) and washers (11).
(6) Remove main circuit breaker (12).
(7) Remove screws (13) and washers (14).
(8) Remove overcurrent relay (15).



ME 6115-339-34/4-8

1. Electrical connector
2. Nut (3)
3. Nut (3)
4. Nut (3)
5. Electrical leads (3)
6. Electrical leads (3)
7. Electrical leads (3)
8. Nut (3)
9. Bus bar (3)
10. Screws (4)
11. Washer (4)
12. Main circuit breaker
13. Screw (4)
14. Washer (4)
15. Overcurrent relay

Figure 4-8. Overcurrent relay and main circuit breaker removal and installation.

c. *Testing.* Overcurrent relay may be tested on the unit using the following procedures.

WARNING

High voltages are present during the operation of this equipment. Death on contact may result if personnel fail to observe safety precautions. Be careful not to contact electrical connections when this equipment is operating. In case of accident from electrical shock, shut down the generator set at once. If the set cannot be shut down, free the victim from the live conductor using a nonconductive device. If the victim is unconscious, apply artificial respiration and get mediacl help.

(1) Connect a AN-2 size jumper wire from terminal L1 to terminal L2 of TB7, and secure firmly.

NOTE

Do not use wire other than AN-2 size.

(2) Start generator set for multipurpose local operation in accordance with instructions in TM 5-6115-339-12 and operate at governed speed.

CAUTION

While performing the next two steps be ready to shut down the generator set as quickly as possible if MAIN CB CLOSURE lamp does not immediately extinguish. Extremely high current could cause extensive damage to the generator set electrical circuits.

(3) Momentarily set MAIN CB circuit breaker switch in CLOSE position and observe that MAIN CB CLOSURE light illuminates, then immediately goes out.

NOTE

Since voltage to the filaments of MAIN CB CLOSURE lamp will be instantaneous it will be necessary to observe MAIN CB CLOSURE lamp closely and while it is shaded from direct light.

(4) If MAIN CB CLOSURE lamp does not immediately extinguish, place MAIN CB circuit switch in OPEN position.

NOTE

If main CB CLOSURE lamp does not immediately extinguish after performing step (4) above, place MASTER switch in OFF position and allow generator set to come to a complete stop. Since the AN-2 wire will burn, it will act as a fuse when the current exceeds the tolerance of the overcurrent relay being tested.

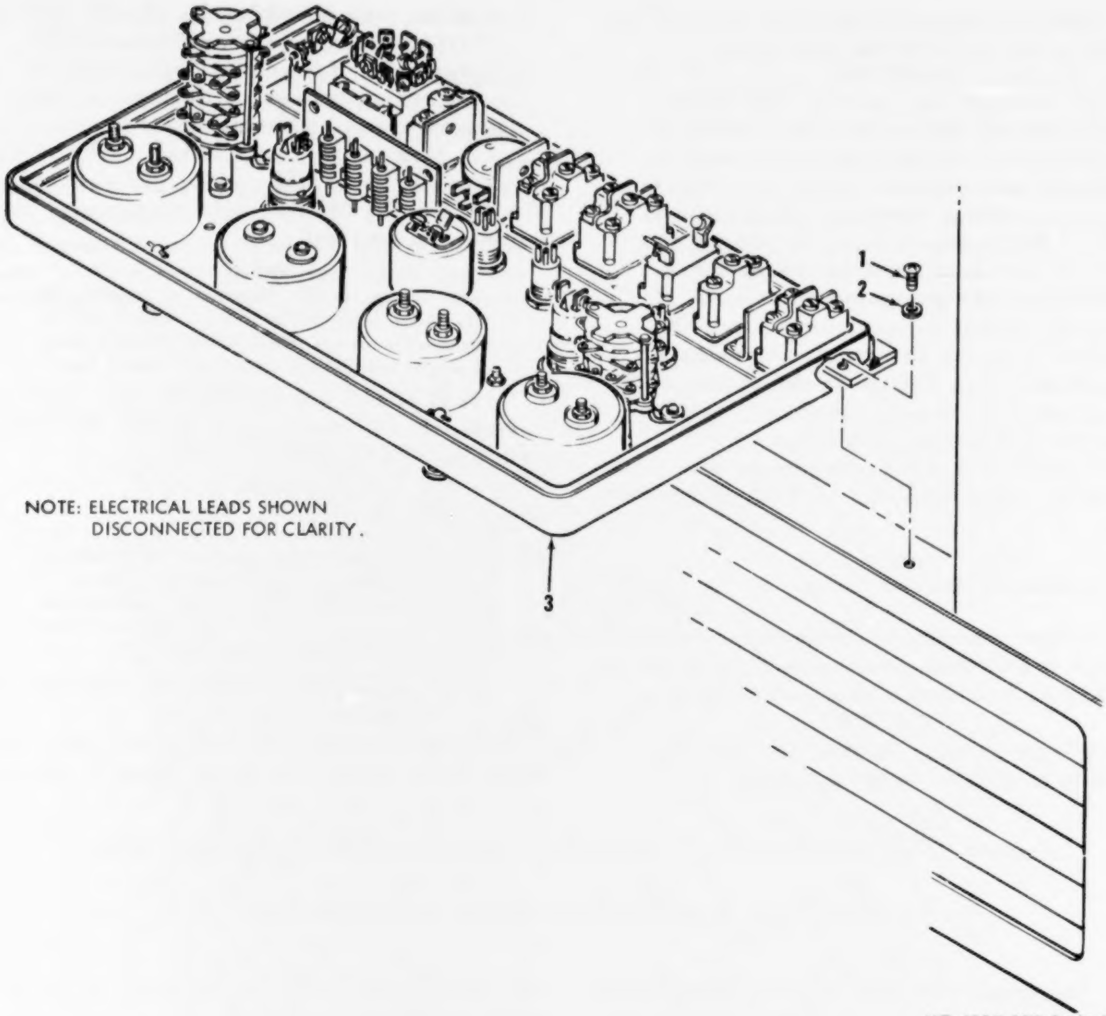
(5) Remove jumper wire from terminals L1 and L2. Replace a defective relay.

d. *Installation.* Install overcurrent relay and main circuit breaker in reverse order of removal.

Section III. ELECTRICAL CONTROLS INSTRUMENTS PANEL AND ELECTRICAL EQUIPMENT RACK ASSEMBLY

4-11. Electrical Controls Instruments Panel

a. *Removal.* Refer to figure 4-9 to remove the electrical controls instruments panel. Tag and disconnect wiring harness electrical leads from panel assembly components.



NOTE: ELECTRICAL LEADS SHOWN
DISCONNECTED FOR CLARITY.

1. Screw (3)
2. Washer (3)
3. Controls instrument panel

Figure 4-9. Electrical controls instruments panel removal and installation.

b. Disassembly. Disassemble electrical controls instrument panel only to the extent necessary to replace a defective component.

c. Installation. Install components and electrical controls instrument panel in the reverse order of removal. Observe the following procedures.

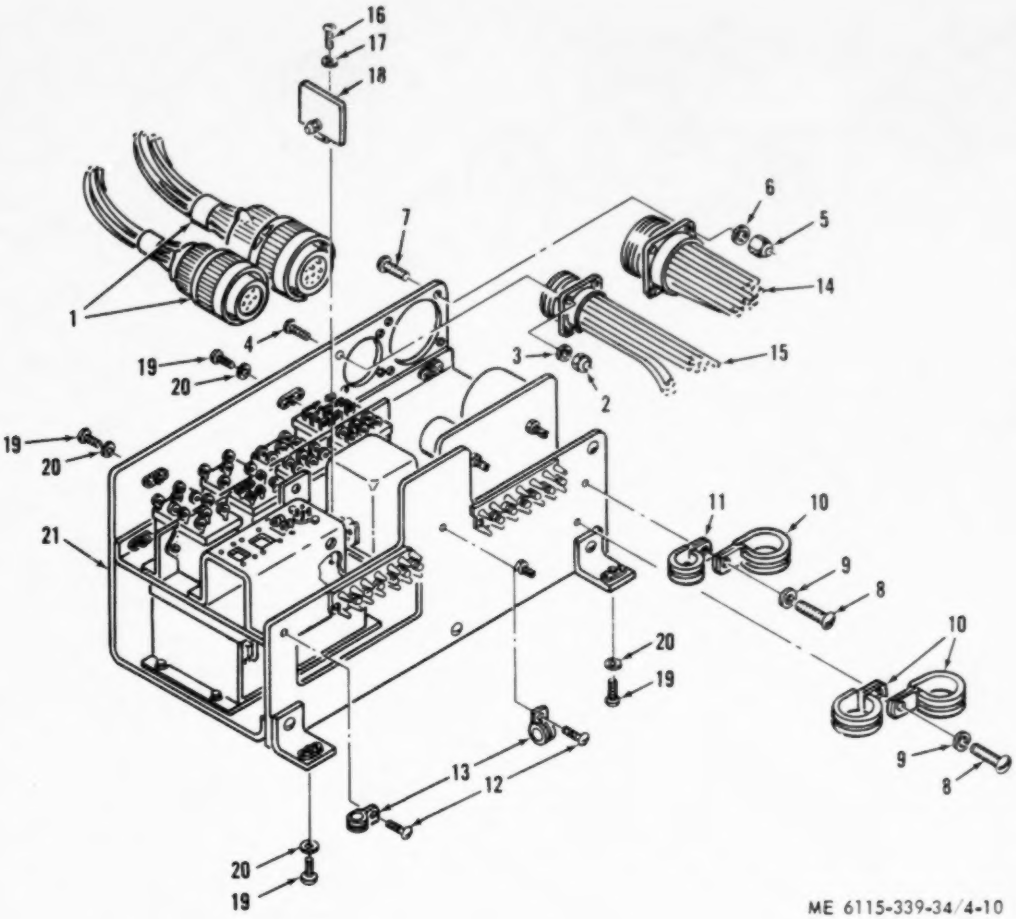
(1) The wattmeter and thermal watt converter must be replaced as a matched set; the frequency meter and transducer must be replaced as a matched set.

(2) The unit parallel selector switch must be installed with terminal number 13 up. The voltampselector switch must be installed with terminals numbers 2 and 3 up.

(3) Do not connect electrical lead to terminal 3 of REMOTE-LOCAL VOLTAGE SENSING. Switch unless operation is anticipated requiring remote voltage sensing. Wrap lead with electrical tape and tag for identification.

4-12. Electrical Equipment Rack Assembly

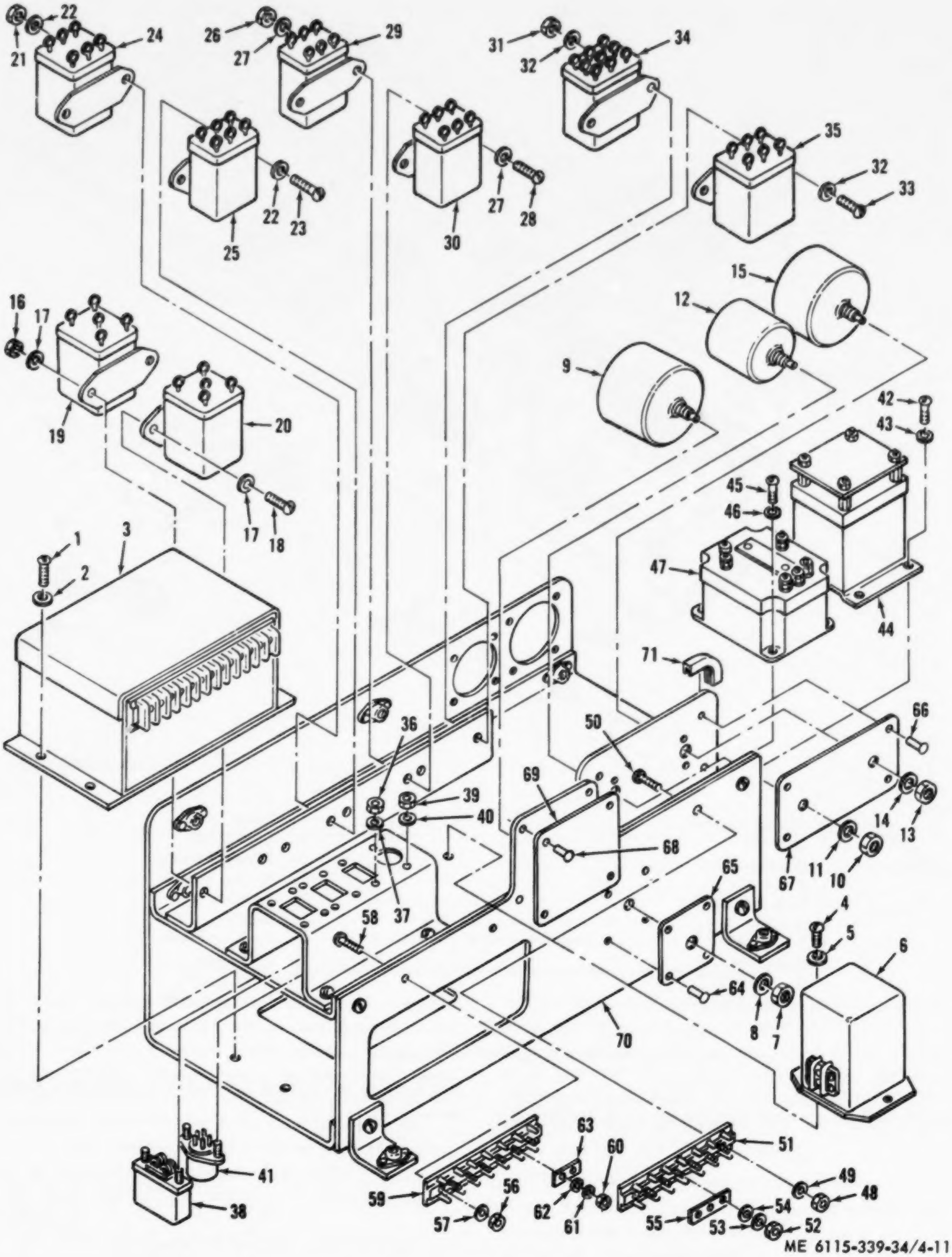
a. Removal. Tag and disconnect wiring harness electrical lead and refer to figure 4-10 to remove the electrical equipment rack.



1. Wiring harness
2. Nut (4)
3. Washer (4)
4. Screw (4)
5. Nut (4)
6. Washer (4)
7. Screw (4)
8. Screw (2)
9. Washer (2)
10. Clamp (3)
11. Clamp
12. Screw (2)
13. Clamp (2)
14. Wiring harness
15. Wiring harness
16. Screw
17. Washer
18. Resistor board
19. Screw (4)
20. Washer (4)
21. Rack assembly

Figure 4-10. Electrical equipment rack removal and installation.

b. Disassembly. Refer to figure 4-11 and disassemble the electrical equipment rack assembly but only to the extent necessary to replace a known defective part.



ME 6115-339-34/4-11

Figure 4-11. Electrical equipment rack assembly, exploded view.

Key to figure 4-11:
1. Screw (4)
2. Washer (4)
3. Thermal watt converter
4. Screw (2)
5. Washer (2)
6. Transducer
7. Nut
8. Washer
9. Resistor, variable
10. Nut
11. Washer
12. Resistor, variable
13. Nut
14. Washer
15. Resistor, variable
16. Nut (2)
17. Washer (4)
18. Screw (2)
19. Relay, master K2
20. Relay, temperature control K9
21. Nut (2)
22. Washer (4)
23. Screw (2)
24. Relay, protection by-pass K8
25. Relay, local-remote voltage sensing K16
26. Nut (2)
27. Washer (4)
28. Screw (2)
29. Relay, overvoltage holding K5
30. Relay, no. 2 holding K4
31. Nut (2)
32. Washer (4)
33. Screw (2)
34. Relay, generator control K12
35. Relay, no. 1 holding K3
36. Nut (2)
37. Washer (2)
38. Relay, ac volt K7
39. Nut (2)
40. Washer (2)
41. Relay, battery temperature sensing K14
42. Screw (4)
43. Washer (4)
44. Relay, undervoltage K11
45. Screw (4)
46. Washer (4)
47. Relay, overvoltage K10
48. Nut (2)
49. Washer (2)
50. Screw (2)
51. Terminal board TB2
52. Nut (6)
53. Washer (6)
54. Washer (6)
55. Link, terminal board TB2
56. Nut (2)
57. Washers (2)
58. Screw (2)
59. Terminal board TB1
60. Nut (6)
61. Washer (6)
62. Washer (6)
63. Link, terminal board TB1
64. Rivet (4)
65. Label
66. Rivet (4)
67. Label
68. Rivet (4)
69. Plate
70. Rack assembly, electrical equipment
71. Rubber channel

c. Installation. Install the electrical equipment rack in the reverse order of removal.

Section IV. ALTERNATING CURRENT RECEPTACLES

4-13. General

The receptacles in this section consists of J19, convenience receptacle and protection fuse and fuseholder J18, 400 hertz ac power receptacle; J14, remote control receptacle and shorting plug P12. They are located on the front of the enclosure below the instrument panels.

4-14. 400 Hertz AC Power Receptacle

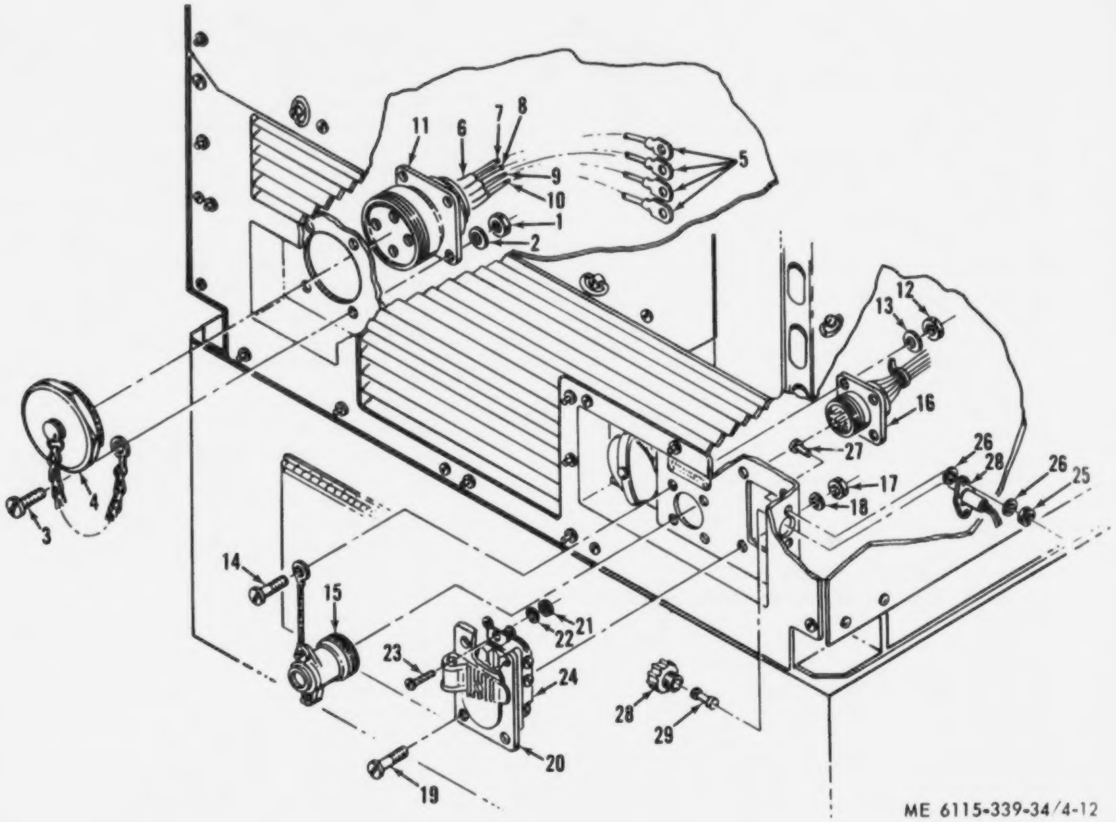
a. Removal.

(1) Tag and disconnect electrical leads from the ac output panel.

(2) Refer to figure 4-12 and remove the ac power receptacle.

b. Disassembly and Reassembly. Refer to figure 4-12 to disassemble and reassemble the ac power receptacle.

c. Installation. Install ac power receptacle in reverse order of removal. Refer to figure 4-12.



ME 6115-339-34/4-12

1. Nut (4)
2. Washer (4)
3. Screw (4)
4. Cap assembly
5. Terminal (4)
6. Insulator
7. Wire assembly
8. Wire assembly
9. Wire assembly
10. Wire assembly
11. Receptacle, J18
12. Nut (4)
13. Washer (4)
14. Screw (4)
15. Plug, P14
16. Receptacle J14
17. Nut (4)
18. Washer (4)
19. Screw
20. Cover plate
21. Nut (2)
22. Washer (2)
23. Screw (2)
24. Receptacle
25. Nut (2)
26. Washer (4)
27. Screw (2)
28. Fuseholder
29. Fuse, F1

Figure 4-12. AC receptacles, removal and installation.

4-15. Receptacles J14, J19; Plug P14 and Fuse holder

a. Removal and Installation. Refer to figure 4-12 to remove and install receptacles J14 and J19: plug P14 and the fuse holder.

b. Cleaning, Inspection and Repair.

(1) Clean with a cloth moistened in an approved cleaning colvent and dry thoroughly.

(2) Inspect for evidence of damage, stripped threads, loose connections or pins, shorting or cracks. Replace any defective component.

Section V. WIRING HARNESSES

4-16. General

The wiring harnesses covered in this section includes the generator set branched wiring harness assembly, the cubicle ac branched wiring harness assembly, and the cubicle dc branched wiring harness assembly. The wiring harnesses provide electrical interconnection for the generator set and its size, and length of wires are given in the wire location chart for each harness.

4-17. Generator Set Branched Wiring Harness Assembly

a. Removal and Installation.

(1) Tag and disconnect all electrical leads and connectors.

(2) Remove all clamps and straps noting location or position of each.

(3) Refer to FO-3 (Located in back of manual) to remove and install the generator set branched wiring harness assembly.

b. Inspection and Repair.

(1) Inspect for evidence of damage, excessive wear, and worn insulation.

(2) Refer to figures 4-13 and 4-14 and check individual wires for continuity.

(3) Replace defective connectors or terminals by unsoldering electrical leads to connector or terminal and installing replacement component. Use rosin core solder, composition SN60, Federal Specification QQ-S-571.

FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)	FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)
DS1-1	DS2-1	L3C18	18	RED	8	P3-H	P8-E	L46A18	18	RED	49
DS1-1	P3-T	L3B18	18	RED	45	P3-J	P2-H	K100B18	18	RED	48
DS1-2	DS2-2	L2R18N	18	RED	16	P3-K	P2-J	K17E18	18	RED	48
DS1-2	TB3-13	L2Q18N	18	RED	46	P3-M	K14-A2	P10D18	18	RED	59
DS2-1	DS3-1	L3D18	18	RED	14	P3-N	TB3-10	P105B18	18	RED	35.5
DS2-2	DS3-2	L2S18N	18	RED	12	P3-S	P2-X	P132D18	18	RED	48
J14-A	TB3-10	P105C18	18	RED	40	P3-U	TB3-4	P21C18	18	RED	29.5
J14-B	TB3-9	P110C18	18	RED	39	P3-W	P8-A	H42B12	12	RED	49
J14-C	S2-1	P7C18	18	RED	72	P3-X	P17-2	H111B18	18	RED	120
J14-D	TB3-4	P21E18	18	RED	34	P3-Z	P17-3	H112B18	18	RED	120
J14-E	M6-1	P16G18	18	RED	68	P3-a	S2-5	P4B18	18	RED	98
J14-F	K14-A2	P10F18	18	RED	32	P3-b	P13-M	L26B18	18	RED	34
J29-A	S2-4	P125C18	18	RED	75	P3-c	P2-a	Q15C18	18	RED	48
J29-B	TB3-14	Q2AP18N	18	RED	70	P3-d	P13-T	P129B18	18	RED	34
J29-C	S2-4	P125B18	18	RED	75	P3-e	P13-U	P130B18	18	RED	34
K1-X2	TB3-14	P2G18N	18	RED	44	P3-g	P17-1	H40D18	18	RED	120
K1-11	P2-A	K7B18	18	RED	53.5	P3-h	P2-U	K24B18	18	RED	55
K1-11	S2-1	P7A18	18	RED	76	P3-j	TB3-9	P110B18	18	RED	34.5
K1-12	P13-L	P11B18	18	RED	42	P3-n	P2-C	K102B18	18	RED	48
M5-1	K1-X1	E8B18	18	RED	79	P8-B	P8G	H44B18	18	RED	8
M6-2	P24-C	E2V 18N	18	RED	16	S2-5	CB1-1	P4A18	18	RED	8
M6-2	TB3-13	E2T18N	18	RED	97	S2-5	P3-a	P4B18	18	RED	75
P12-H	TB3-14	P2F12N	12	RED	52	TB3-1	K14-A1	P9A18	18	RED	48
P13-A	TB3-4	P21D18	18	RED	27	TB3-1	P20-A	Q9C18	18	RED	50
P13-B	K14-A2	P10E18	18	RED	32	TB3-1	P3-A	P9B18	18	RED	26.5
P13-C	TB3-13	P2P18N	18	RED	36	TB3-11	B3-	Q2AM18N	18	RED	94
P2-B	K1-X1	K8A18	18	RED	60	TB3-11	B5-	H2AL18N	18	RED	120
P2-F	P24-A	E85A18	18	RED	75	TB3-11	P8-D	H2D12N	12	RED	49
P2-G	P24-B	E84A18	18	RED	75	TB3-12	P3-V	P2H12N	12	RED	37.5
P2-S	R12-CR	E82A-CHROM	-	-	73	TB3-14	P17-4	H2E18N	18	RED	96
P2-T	M2-AL	E83A-ALML	-	-	73	TB3-3	M6-1	E16E18	18	RED	87
P2-Z	TB3-13	P2N18N	18	RED	45	TB3-3	P2-D	K16F18	18	RED	35
P21-A	P8-B	H44A18	18	RED	150	TB3-3	P3-E	P16D18	18	RED	28.5
P3-C	J29-D	P5A18	18	RED	65	TB3-7	K1-12	P11C18	18	RED	37.5
P3-D	P8-F	H41D18	18	RED	49	TB3-7	P2-W	K11A18	18	RED	38
P3-G	S2-2	P6D18	18	RED	98	TB3-7	P3-L	K11D18	18	RED	32.5

ME 6115-339-34/4-13

Figure 4-13. Generator set protected dc wiring harness wire location chart.

FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)
CB1-2	M4+	D31A12	12	RED	7
CB1-2	P3-s	P31B12	12	RED	62
K1-B2	M4-	D1C12	12	RED	57
P12-I	CB1-2	P31C12	12	RED	70
P3-p	P12-D	P106B18	18	RED	71

ME 6115-339-34/4-14

Figure 4-14. Generator set unprotected wiring harness wire location chart.

4-18. Cubicle AC Branched Wiring Harness

a. Removal and Installation.

(1) Tag and disconnect all electrical leads and connectors.

(2) Remove all straps and clamps noting their location and position.

(3) Refer to figure 4-15 to remove and install the cubicle ac branched wiring harness.

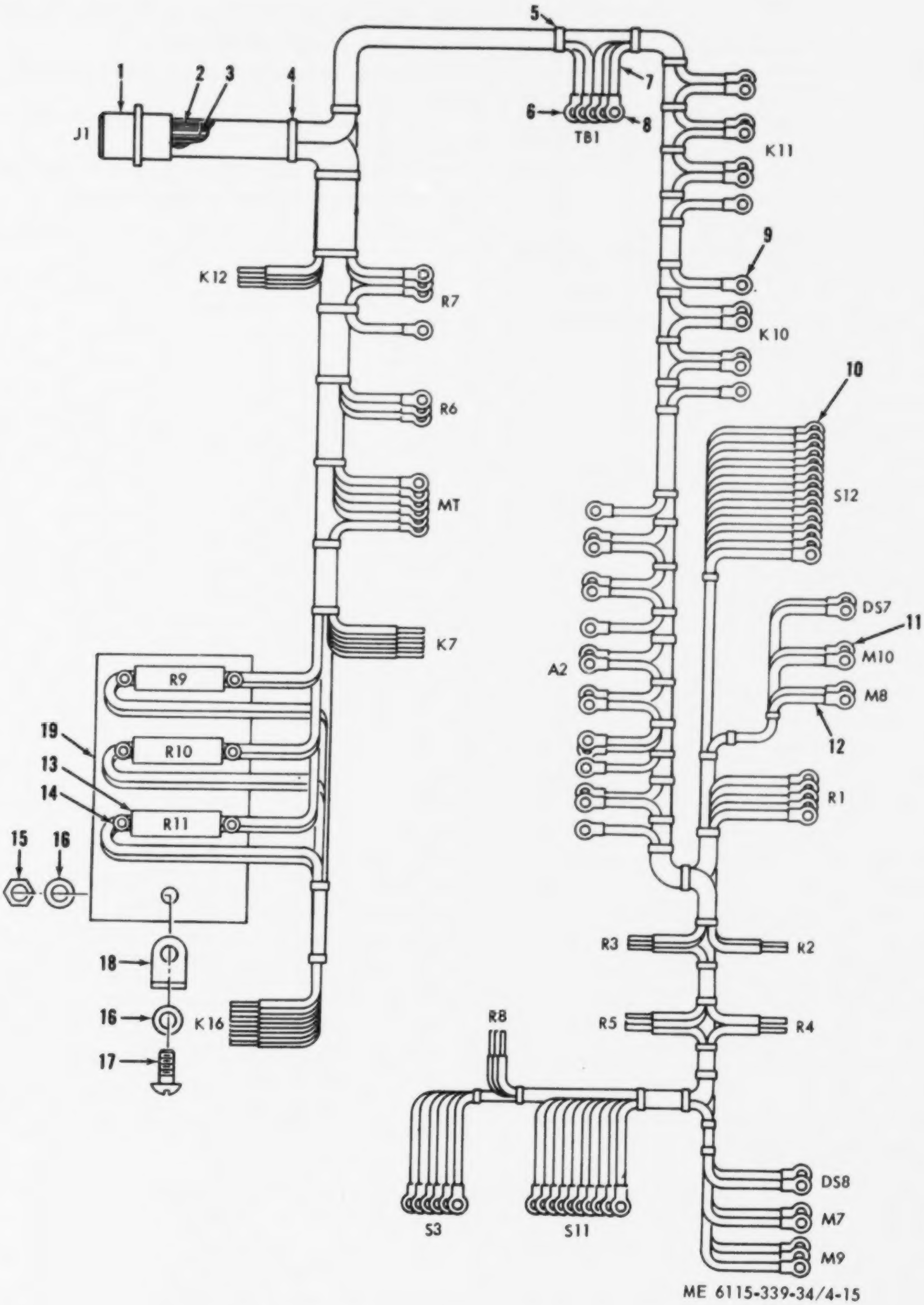


Figure 4-15. Cubicle ac branched wiring harness, removal and installation.

Key to figure 4-15:
1. Connector, receptacle J1
2. Insulation, sleeving 0.166 in id 1.00 in. lg
3. Insulation, sleeving 0.118 in id 1.00 in. lg (83)
4. Strap, tie (AR)
5. Strap, tie (AR)
6. Terminal, lug no 18 wire (45)
7. Wire, electrical, 600 volt white insulated 18 in lg
8. Terminal lug no 12 wire
9. Terminal lug no 18 wire (6)
10. Terminal lug no 18 wire (69)
11. Terminal lug no 18 wire (11)
12. Wire electrical 600 volt white insulated (AR)
13. Resistor, 1000 ohm, 1 watt R9, R10, R11, (3)
14. Terminal, resistor mounting (6)
15. Nut, self-locking
16. Washer, flat (2)
17. Screw, machine
18. Bracket
19. Resistor board

b. Inspection and Repair.

(1) Inspect for evidence of damage, excessive wear, worn or frayed insulation.

(2) Refer to figure 4-15 and check individual wires for continuity.

(3) Replace defective connectors or terminals. If soldering is required use rosin core solder, composition SN60. Solder according to Military Specification MIL-S-6872.

FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)	FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)
CB4-2	TB5-9	X39M18C	18	WHITE	53	P1-b	P7-A	X55A18	18	WHITE	34
CT1-X1	P9-A	X79A18	18	WHITE	36	P1-c	P11-A	X136A18	18	WHITE	27
CT1-X2	CT2-X2	X22N18N	18	WHITE	6	P1-d	CB3-L3	L63E18C	18	WHITE	55
CT2-X1	P9-E	X78A18	18	WHITE	40	P1-e	CB3-L1	L65E18A	18	WHITE	55
CT2-X2	CT3-X2	X22P18N	18	WHITE	6	P1-f	TB5-1	X66B18A	18	WHITE	52.5
CT3-X1	P9-1	X77A18	18	WHITE	44	P1-g	TB5-2	X67B18B	18	WHITE	49.5
CT3-X2	TB4-8	X22Q18N	18	WHITE	34	P1-h	TB5-3	X68B18C	18	WHITE	46.5
CT4-X1	P1-Y	X52B18	18	WHITE	45	P1-j	P9-D	V72B18	18	WHITE	46
CT4-X1	P11-H	X52A18	18	WHITE	52	P1-m	P9-J	V74B18	18	WHITE	46
CT4-X2	P1-X	X51B18	18	WHITE	45	P1-n	P10-A	X91B18	18	WHITE	52
CT4-X2	P11-R	X51A18	18	WHITE	52	P1-p	P10-B	X92B18	18	WHITE	52
P11-K	P1-A	X120A18A	18	WHITE	27	P1-q	P10-D	X93B18	18	WHITE	52
						P1-r	TB5-8	X47D18B	18	WHITE	57
						P1-u	TB4-6	X22L12N	12	WHITE	25
C1-1	J19-1	X114B18C	18	WHITE	14	P1-w	P11-E	V60A18	18	WHITE	23
F1-1	TB4-3	X39D12C	12	WHITE	47	P1-y	K14-T1	X32B18A	18	WHITE	36
F1-2	J19-1	X114A12C	12	WHITE	15	P1-z	P9-H	V73B18	18	WHITE	46
J14-G	P1-v	V101B18	18	WHITE	58	P10-G	P2-M	X89A18	18	WHITE	73
J-14-H	P1-H	V12B18	18	WHITE	58	P10-H	P2-L	X86A18	18	WHITE	73
J14-J	TB4-2	V13D18	18	WHITE	50	P10-J	P2-N	X87A18	18	WHITE	73
J14-M	TB4-3	X39E18C	18	WHITE	49	P10-L	J14-U	V138A18	18	WHITE	55
J14-P	P1-D	X117B18	18	WHITE	58	P10-T	P2-P	X88A18	18	WHITE	73
J14-R	P1-E	X116B18	18	WHITE	58	P11-C	P7-C	X56A18	18	WHITE	34
J14-S	P1-F	X115B18	18	WHITE	58	P11-F	TB4-2	V13C18	18	WHITE	38
J14-V	TB4-7	X22K18N	18	WHITE	45	P11-G	TB4-4	V50B18	18	WHITE	36
J19-2	TB4-8	X22J12N	12	WHITE	43	P11-M	P7-D	V54A18	18	WHITE	35
P1-B	P11-L	X119B18	18	WHITE	23	P11-N	TB4-4	V50C18	18	WHITE	27
P1-C	P11-S	X118B18	18	WHITE	23	P12-C	CB4-1	X104A18C	18	WHITE	60
P1-J	TB4-2	V13B18	18	WHITE	29	P7-F	TB4-4	V50A18	18	WHITE	23
P1-K	K14-T3	X14B18C	18	WHITE	38	P9-F	TB5-8	X47C18B	18	WHITE	47
P1-L	J14-K	V37B18	18	WHITE	50	TB4-6	P10-K	X22AK18N	18	WHITE	36
P1-M	J14-T	V58C18	18	WHITE	58	TB4-6	PII-J	X22S18N	18	WHITE	34
P1-N	J14-N	V95C18	18	WHITE	58	TB4-6	P9-B	X22R18N	18	WHITE	35
P1-P	TB4-3	X39F18C	18	WHITE	28	TB4-7	P12-E	X22AJ18N	18	WHITE	60
P1-Q	P11-D	V59B18	18	WHITE	23	TB4-9	J14-L	V36C18	18	WHITE	54
P1-R	P10-F	X107B18	18	WHITE	52	TB4-9	PI-G	V36B18	18	WHITE	40
P1-S	P10-C	X108B18	18	WHITE	52	TB4-9	P10-M	V36A18	18	WHITE	36
P1-T	P10-E	X109B18	18	WHITE	52	TB5-12	TB4-7	X22M12N	12	WHITE	36
P1-V	TB5-5	X48B18B	18	WHITE	24	TB5-7	P1-0	X38C18A	18	WHITE	52
P1-W	P7-B	X57A18	18	WHITE	34	TB5-7	P9-C	X38B18A	18	WHITE	59
P1-Z	P11-B	X137A18	18	WHITE	27	TB5-9	P9-G	X39B18C	18	WHITE	44
						TB5-9	TB4-3	X39C12C	12	WHITE	37

ME 6115-339-34/4-16

Figure 4-16. Cubicle ac branched wiring harness wire location chart.

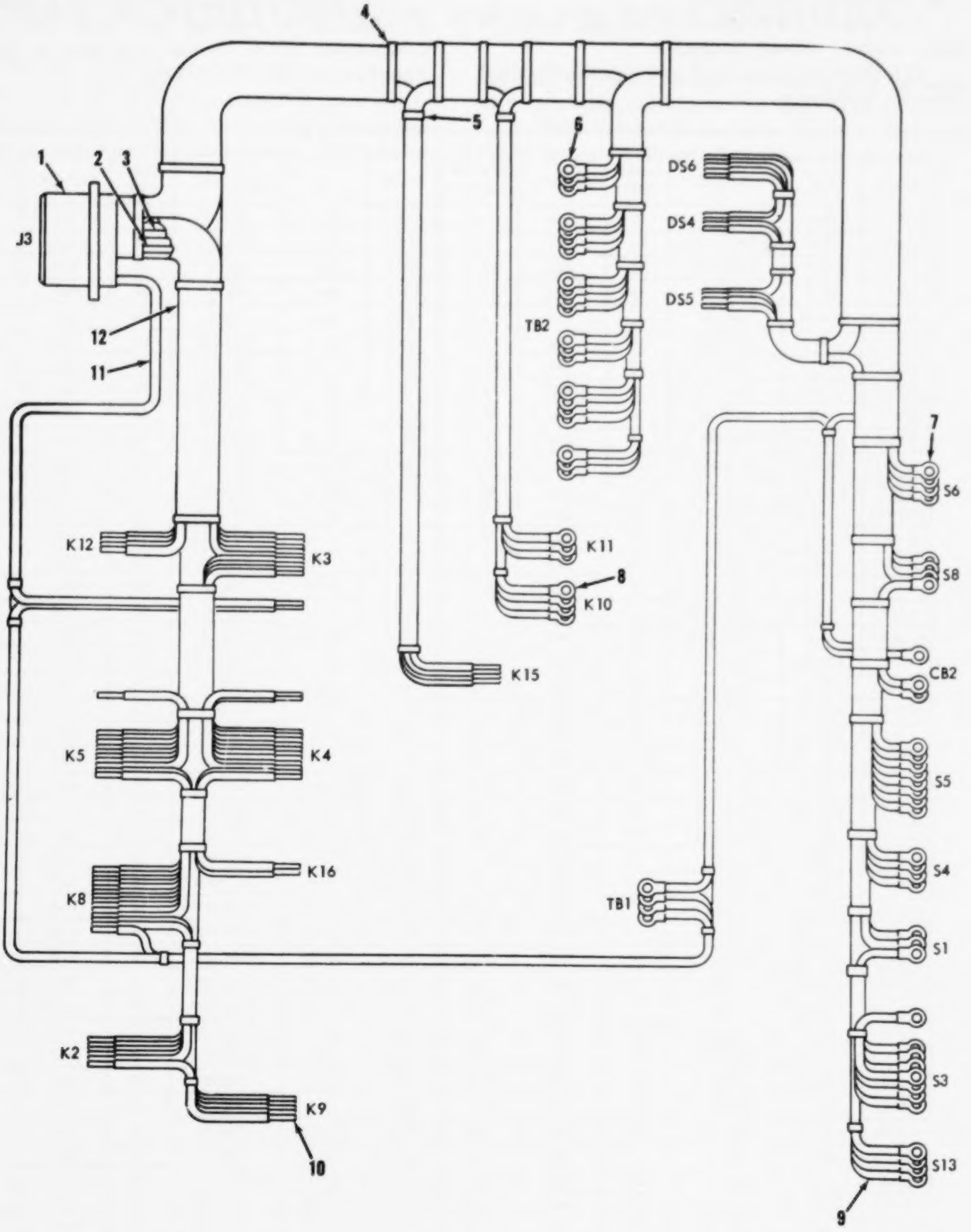
4-19. Cubicle DC Branched Wiring Harness

a. Removal and Installation.

(1) Tag and disconnect all electrical leads and connectors.

(2) Remove all straps and clamps noting their position and location.

(3) Refer to figure 4-17 to remove and install the cubicle dc branched, wiring harness.



ME 6115-339-34/4-17

1. Connector, receptacle
2. Insulation, sleeving, 0.166 in id 1.00 inch long (5)
3. Insulation sleeving 0.118 in id 1.00 inch long (112)
4. Strap, tie large (AR)
5. Strap tie small (AR)
6. Terminal lug no 12 wire, TB1, TB2, CB2, and S8 (7).
7. Terminal lug no 18 wire (4)
8. Terminal lug no 18 wire (55)
9. Wire, electrical AWG no 18, red insulated (AR)
10. Wire electrical, AWG no 12, red insulated (AR)
11. DC wiring harness assembly, unprotected
12. DC wiring harness assembly, protected

Figure 4-17. Cubicle dc branched wiring harness removal and installation.

b. Inspection and Repair.

(1) Inspect for evidence of damage, excessive wear, worn or frayed insulation.

(2) Refer to figure 4-18 and check individual wires for continuity.

(3) Replace defective connectors or terminals. If soldering is required use rosin core solder, composition SN60. Solder according to Military Specification MIL-S-6872.

FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)	FROM	TO	WIRE NO.	WIRE SIZE	COLOR	LENGTH (INCHES)
CB2-1	S8-2	H41A12	12	Red	4.0	S13-2	S6-3	P9N18	18	Red	46.0
CB2-1	J3-D	H41C18	18	Red	9.5	S13-3	J3-d	P129A18	18	Red	32.5
DS4-1	DS6-1	L2AK18N	18	Red	10.0	S3-1	J3-G	P6A18	18	Red	29.0
DS4-2	J3-b	L26A18	18	Red	34.0	S3-1	S3-5	P6B18	18	Red	3.0
DS4-3	DS6-3	L4H18	18	Red	10.0	S3-2	J3-C	P5B18	18	Red	29.0
DS5-1	DS4-1	L2AJ18N	18	Red	11.0	S3-3	J3-N	P105A18	18	Red	32.0
DS5-2	J3-H	L46B18	18	Red	37.0	S3-5	K2-1	P6C18	18	Red	42.0
DS6-2	K10-P	L34C18	18	Red	43.0	S3-6	J3-j	P110A18	18	Red	32.0
DS6-2	S4-3	P34A18	18	Red	46.0	S4-2	K5-B2	P27A18	18	Red	40.0
K10-P	K5-X1	P34B18	18	Red	26.0	S4-5	K12-B3	P28A18	18	Red	46.0
K10-T	TB2-5	P11H18	18	Red	46.0	S4-6	K11-A2	P29A18	18	Red	37.0
K10-T	K12-B2	P11J18	18	Red	46.0	S5-2	K4-X1	P16A18	18	Red	46.0
K12-X1	K4-C3	P19A18	18	Red	13.0	S5-2	J3-E	P16C18	18	Red	33.0
K15-1	J3-Z	H112A18	18	Red	15.0	S5-3	J3-U	P21A18	18	Red	46.0
K15-3	K9-1	H43A18	18	Red	6.5	S5-4	K8-C3	P10A18	18	Red	47.0
K15-4	K9-2	H40A18	18	Red	6.5	S5-4	J3-M	P10C18	18	Red	32.0
K15-5	J3-X	H111A18	18	Red	15.0	S5-5	S1-2	P4S18	18	Red	AR
K16-X1	J3-e	P130A18	18	Red	15.0	S6-2	K8-X1	P35A18	18	Red	46.0
K2-4	K3-D2	K9L18	18	Red	14.0	S6-5	K8-X2	P141A18	12	Red	46.0
K3-A1	J3-p	P106A18	18	Red	8.0	S8-2	DS5-3	L41B18	18	Red	6.0
K3-B2	K8-C2	P25A18	18	Red	14.0	S8-3	K9-2	H40B12	18	Red	49.0
K3-C3	K8-C3	P10B18	18	Red	15.0	S8-3	J3-g	H40C18	18	Red	37.0
K3-D1	J3-n	K102A18	18	Red	9.5	TB1-1	J3-s	P31E12	12	Red	24.0
K3-X1	J3-S	P132C18	18	Red	46.0	TB1-1	CB2-2	P31F12	12	Red	25.0
K4-B1	K4-A2	P11N18	18	Red	4.0	TB1-1	K8-D1	P31G18	18	Red	20.0
K4-B3	J3-h	K24A18	18	Red	10.0	TB1-1	K3-A2	P31H18	18	Red	26.0
K4-C2	K5-D1	P18B18	18	Red	6.0	TB2-1	K2-5	P2X18N	18	Red	29.0
K4-X1	K4-A1	P16H18	18	Red	4.0	TB2-1	S6-6	P2Z18N	18	Red	46.0
K5-B1	K5-C1	P11L18	18	Red	4.0	TB2-1	K16-X2	P2AA18N	18	Red	26.0
K5-B1	K4-B1	P11M18	18	Red	6.0	TB2-2	K5-X2	P2AB18N	18	Red	23.0
K5-C2	K11-A3	P17C18	18	Red	19.0	TB2-2	K4-X2	P2AC18N	18	Red	21.0
K5-D2	K4-C3	P19B16	18	Red	6.0	TB2-2	K12-X2	P2AD18N	18	Red	23.0
K8-A1	K4-B2	P15A18	18	Red	15.0	TB2-2	K3-X2	P2AE18N	18	Red	21.0
K8-A1	J3-c	Q15B18	18	Red	17.0	TB2-3	J3-V	P2W12N	12	Red	16.0
K8-A2	K4-A3	P132B18	18	Red	13.0	TB2-3	DS5-1	L2AH18N	18	Red	27.0
K8-A2	K3-X1	P132A18	18	Red	12.0	TB2-4	J3-a	P4E18	18	Red	15.0
K8-B1	J3-J	K100A18	18	Red	18.0	TB2-4	S1-2	P4F18	18	Red	20.0
K8-B3	K5-D1	P18A18	18	Red	15.0	TB2-4	K3-C2	P4J18	18	Red	19.0
K8-D2	K2-2	P4L18	18	Red	6.0	TB2-4	K2-2	P4K18	18	Red	26.0
K9-4	J3-W	H42A12	12	Red	16.0	TB2-5	J3-L	P11E18	18	Red	14.0
K9-5	K2-5	P2Y18N	18	Red	6.0	TB2-5	K8-B2	P11F18	18	Red	26.0
S1-2	DS6-3	L4G18	18	Red	46.0	TB2-5	K5-C1	P11K18	18	Red	20.0
S1-3	J3-T	L3A18	18	Red	31.0	TB2-6	K3-B1	P17A18	18	Red	19.0
S13-2	J3-A	K9J18	18	Red	46.0	TB2-6	K11-A3	P17B18	18	Red	18.0
S13-2	K3-D2	K9K18	18	Red	46.0	TB2-6	J3-K	K17D18	18	Red	14.0

ME 6115-339-34/4-18

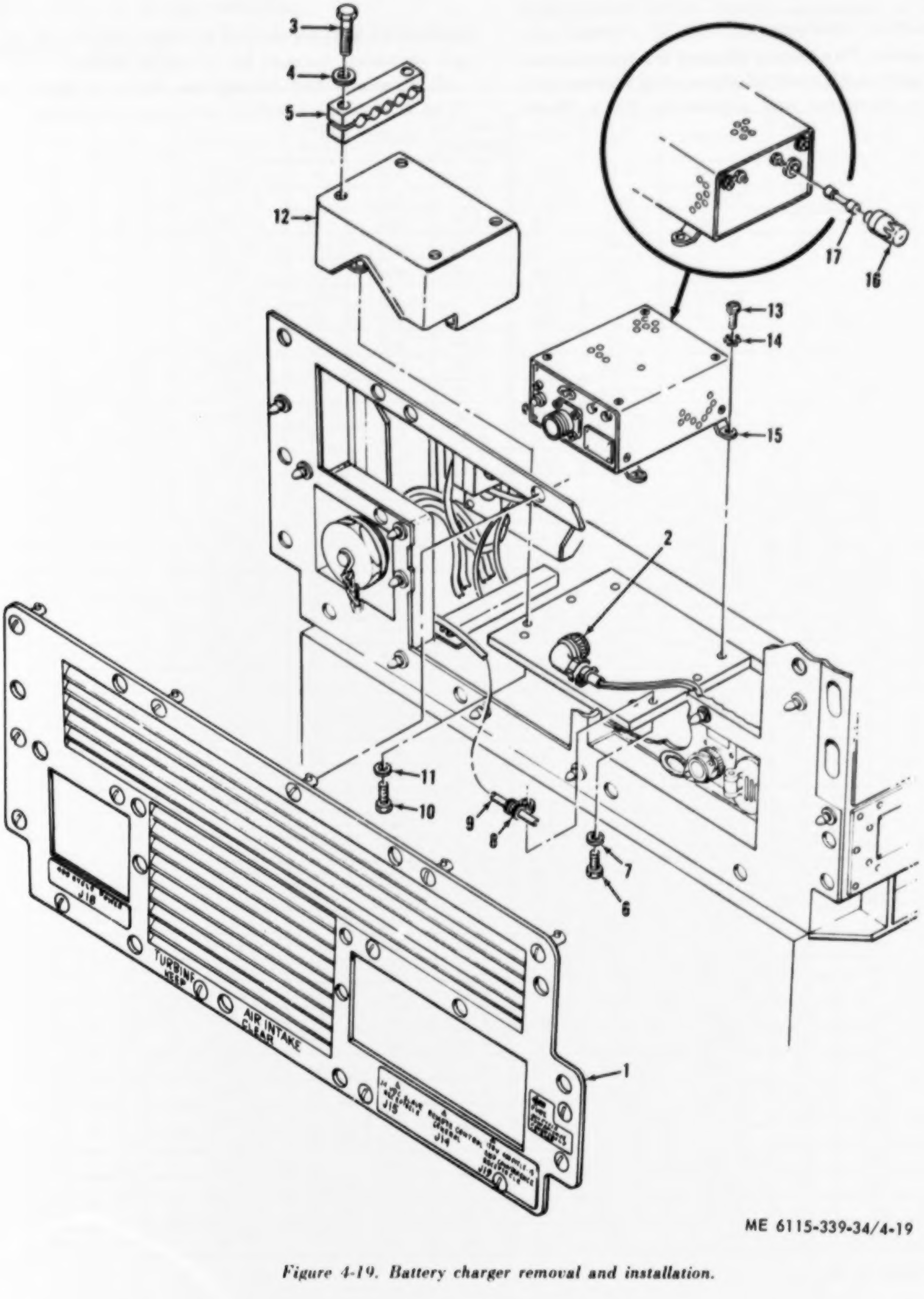
Figure 4-18. Cubicle dc branched wiring harness wire location chart.

Section VI. BATTERY CHARGER AND 24 VDC SLAVE RECEPTACLE

4-20. Battery Charger

a. General. The battery charger is a transformer rectifier unit which rectifies alternating current and delivers a regulated and adjustable 24 v direct current, 15 ampere output for recharging batteries and operating current for dc components.

b. Removal and Installation. Refer to figure 4-19 to remove and install the battery charger.



ME 6115-339-34/4-19

Figure 4-19. Battery charger removal and installation.

Key to figure 4-19:
1. Lower front panel
2. Connector P12
3. Bolt (4)
4. Washer (4)
5. Fairlead
6. Bolt (6)
7. Washer (2)
8. Clamp (2)
9. Wire assembly
10. Bolt (4)
11. Washer (4)
12. Shield
13. Screw (4)
14. Washer (4)
15. Battery charger
16. Fuse holder cap
17. Fuse

c. Cleaning, Inspection and Repair.

(1) Clean battery charger (15) with filtered compressed air and wipe externally with a cloth dampened with an approved cleaning solvent.

(2) Visually inspect battery charger (15) for damage to enclosure and bent or broken pins in electrical receptacle. Inspect for blown fuse (17).

(3) Visually inspect shield (12) for cracks or distortion

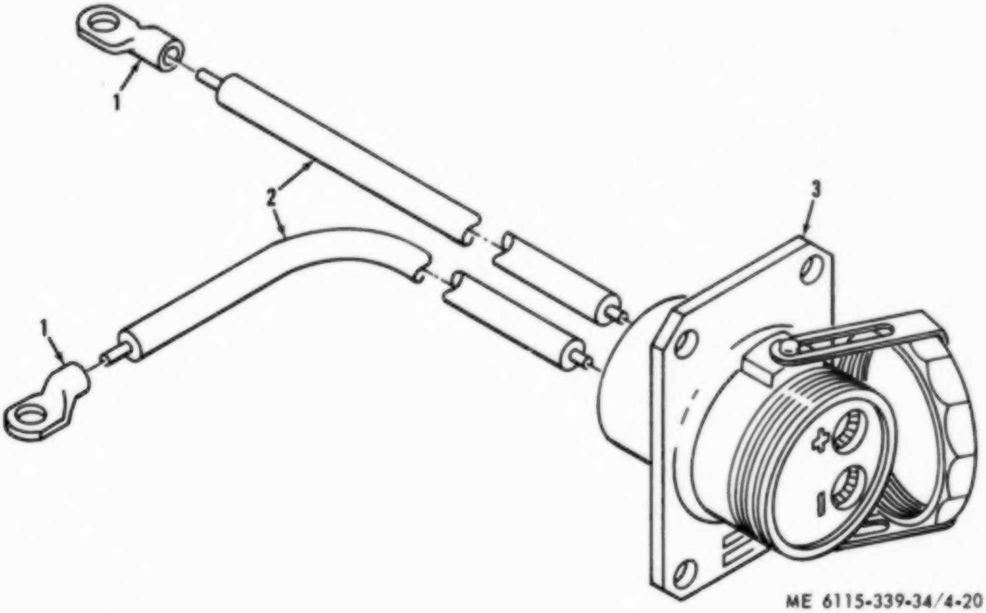
(4) Replace all parts that do not meet inspection requirements and are damaged beyond simple repair. Replace a blown fuse. (17).

4-21. 24V DC Slave Receptacle J15

a. General. The 24V DC SLAVE RECEPTACLE J15 is a connection receptacle for an external battery or other 24V dc power source to provide starting and operating current for the generator set when the generator set batteries are discharged or for operation of the winterization equipment without using the generator set batteries.

b. Removal. Refer to TM 5-6115-339-12 for removal of the 24v DC SLAVE RECEPTACLE J15.

c. Disassembly. Disassemble 24V DC SLAVE RECEPTACLE J15 according to sequence of index numbers assigned to figure 4-20 only to the extend required to replace a damaged or defective component. Unsolder soldered connections between wire (2) and terminals (1), and between wire (2) and connector (3) to remove components.



1. Terminal (2)
2. Wire
3. Connector J15

Figure 4-20. 24V DC Slave receptacle, exploded view.

d. Cleaning, Inspection and Repair.

(1) Clean components with filtered compressed air or a cloth dampened with an approved cleaning solvent.

(2) Inspect components for cracks, distortion, or other physical damage. Use a multimeter to check for continuity through wires (2).

(3) Replace all components that do not meet inspection requirements and are damaged beyond simple repair. Cut replacement wire (2) to same length as removed wire.

e. Reassembly. Assemble 24V DC SLAVE RECEPTACLE J15 in reverse order of disassembly using figure 4-20 as a guide and observing the following.

(1) Identify wires and assemble harness according to Military Specification MIL-W-5088B.

(2) Solder connections using solder composition SN60.

f. Installation. Refer to TM 5-6115-339-12 for installation of the 24V DC SLAVE RECEPTACLE J15.

CHAPTER 5

REPAIR OF FUEL SUPPLY SYSTEM

Section I. FUEL SUPPLY SYSTEM WIRING AND PLUMBING INSTALLATION

5-1. General

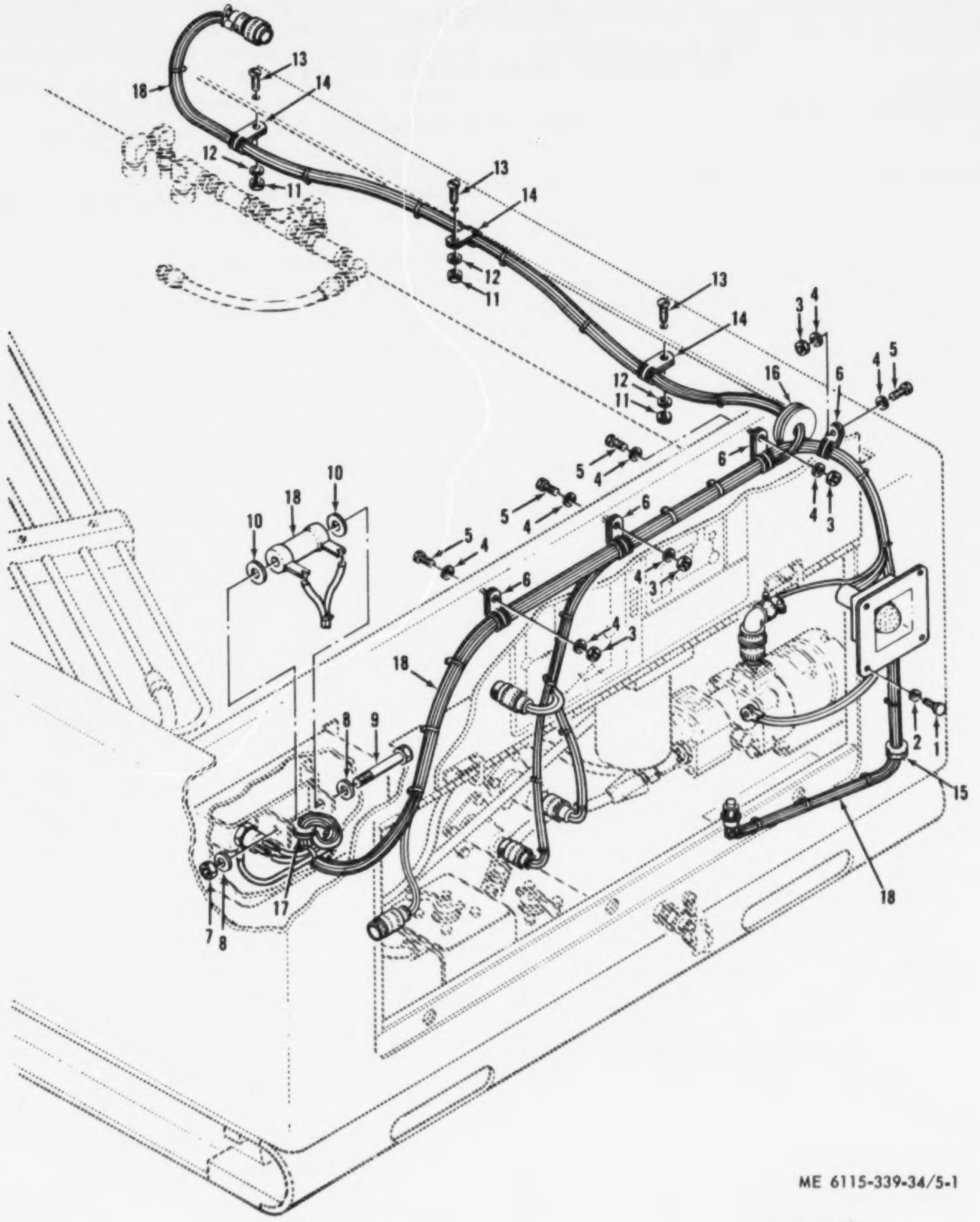
This section contains repair instructions for the fuel tank base wiring harness, hose assemblies, tube assemblies, and plumbing fittings.

5-2. Fuel Tank Base Wiring Harness

a. *Removal and Installation.* Refer to figure 5-1 to remove and install the fuel tank base wiring harness assembly.

NOTE

Tag or otherwise identify electrical leads. Note location of attaching clamps for aid at installation.

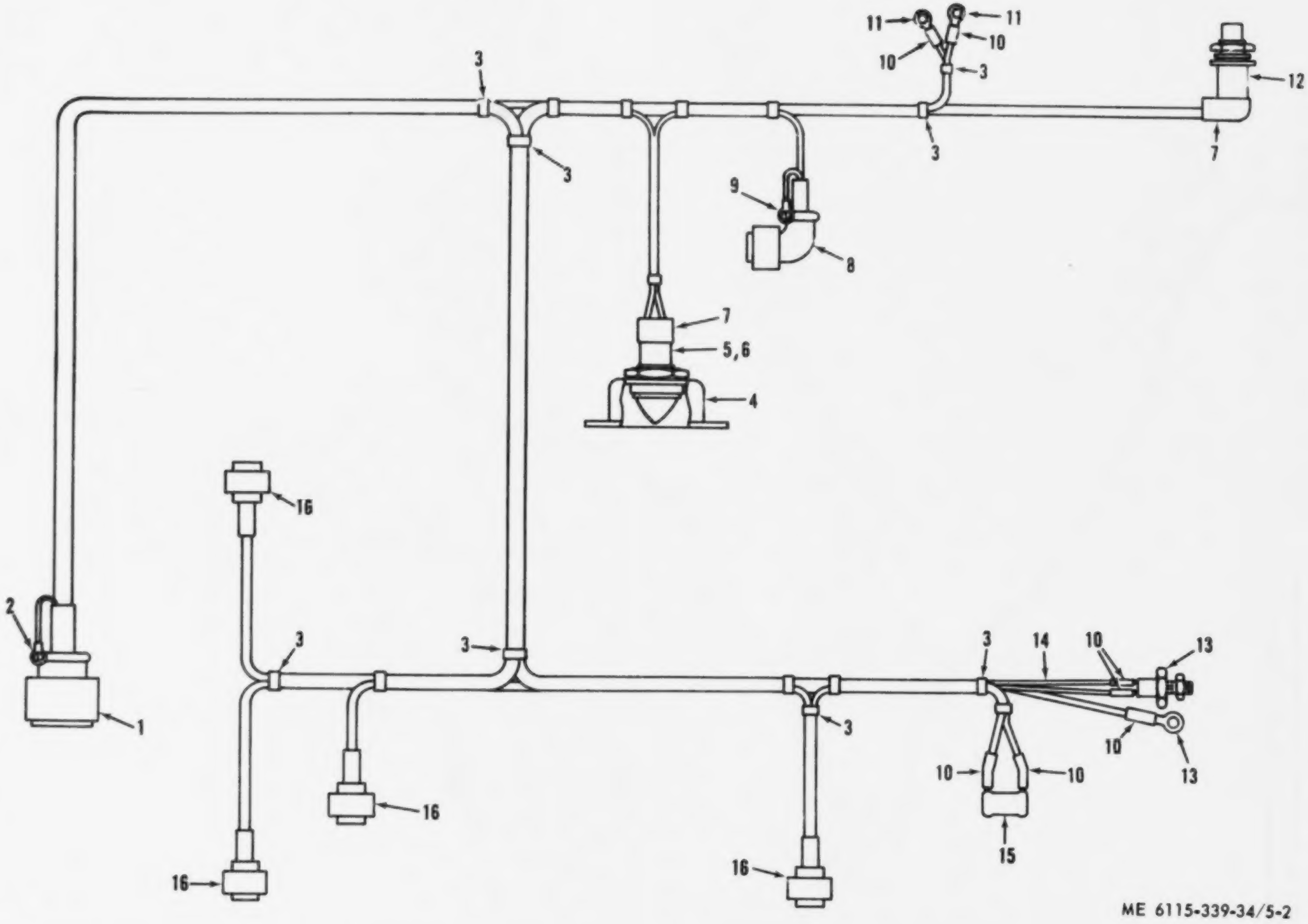


ME 6115-339-34/5-1

1. Bolt (4)
2. Washer (4)
3. Nut (4)
4. Washer (8)
5. Bolt (4)
6. Clamp (5)
7. Nut
8. Washer (2)
9. Screw
10. Washer (2)
11. Nut (3)
12. Washer (3)
13. Screw (3)
14. Clamp (3)
15. Grommet
16. Grommet
17. Grommet
18. Fuel tank base wiring harness

Figure 5-1. Fuel tank base wiring harness removal and installation.

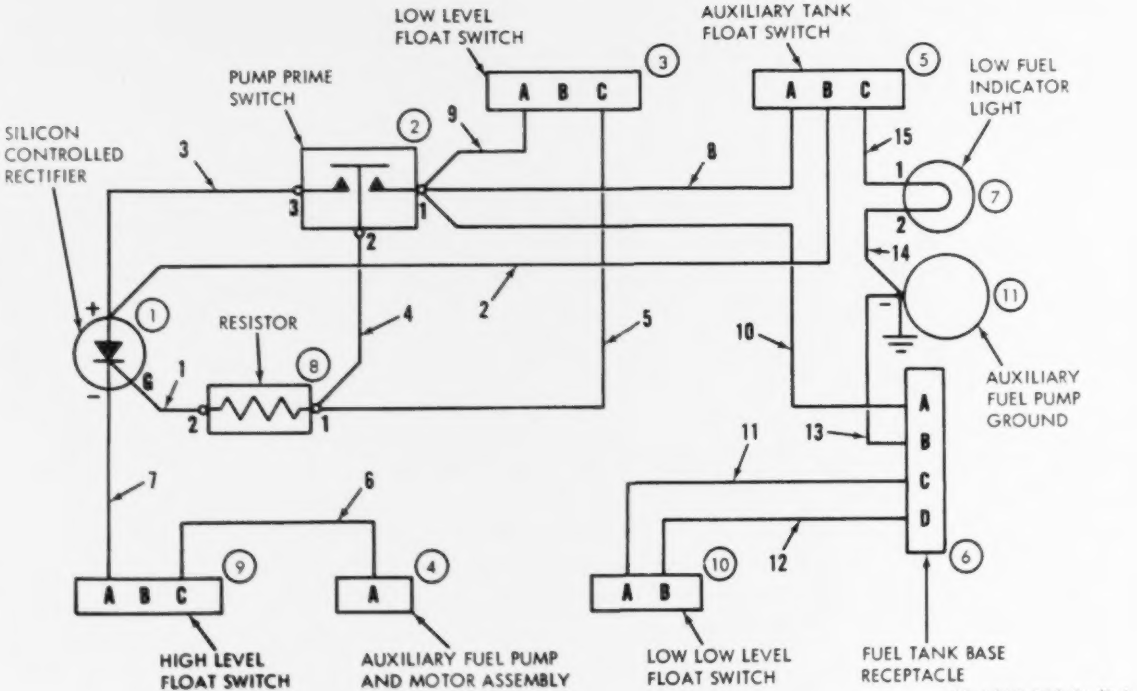
b. Disassembly and Reassembly. Disassemble wiring harness only to the extent required to replace a known defective component. Refer to figure 5-2 for location of wiring harness components and to figure 5-3 for location of individual wires.



1. Connector (fuel tank base)
2. Terminal
3. Cable tie
4. Bracket
5. Low fuel indicator light
6. Lamp
7. Potting compound
8. Connector (auxiliary fuel pump and motor)
9. Terminal
10. Insulation sleeving (7)
11. Terminal (2)
12. Switch (pump Prime)
13. Rectifier
14. Wire (shielded)
15. Resistor (R14)
16. Connector (4)

Figure 5-2. Fuel tank base wiring harness components.

INDEX NO.	LENGTH INCHES	WIRE NO.	LOCATION NO.	PIN NO.	LOCATION NO.	PIN NO.
			FROM		TO	
1	10	Q139A18	1	(G)	8	2
2	24	Q124B18	1	(+)	5	B
3	63	O124A18	1	(+)	2	3
4	62	Q123B18	2	2	8	1
5	42	Q123A18	3	C	8	1
6	39	Q122A18	4	A	9	C
7	35	Q121A18	1	(-)	9	A
8	60	Q9R18	5	A	2	1
9	56	Q9Q18	3	A	2	1
10	74	Q9P18	6	A	2	1
11	82	P125A18	6	C	10	A
12	82	P5B18	6	D	10	B
13	70	Q2AQ18N	6	B	11	(-)
14	28	L2AR18N	7	2	11	(-)
15	50	L23A18	7	1	5	C


LOW LEVEL FLOAT SWITCH
AUXILIARY TANK FLOAT SWITCH
PUMP PRIME SWITCH
SILICON CONTROLLED RECTIFIER
LOW FUEL INDICATOR LIGHT
RESISTOR
AUXILIARY FUEL PUMP GROUND
HIGH LEVEL FLOAT SWITCH
AUXILIARY FUEL PUMP AND MOTOR ASSEMBLY
LOW LOW LEVEL FLOAT SWITCH
FUEL TANK BASE RECEPTACLE
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
A B C
A B C
A B C
A
A B
A B C D
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
G
+
-

ME 6115-339-34/5-3

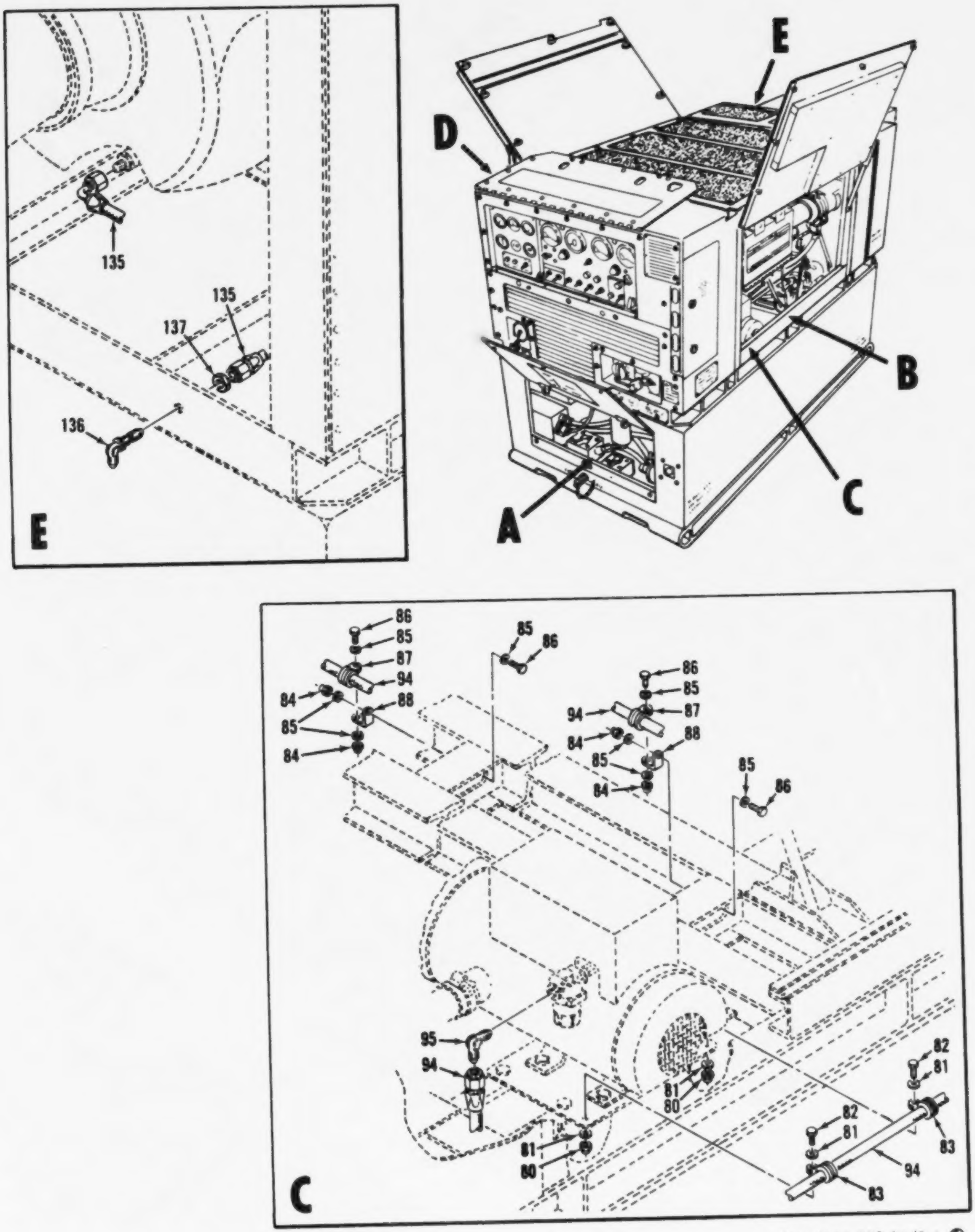
Figure 5-3. Fuel tank base wiring harness wiring diagram and wire identification chart.

c. Repair. Use multimeter and perform continuity checks. Replace any part that is defective and is damaged beyond simple repair.

5-3. Hose and Tube Assemblies and Plumbing Fittings

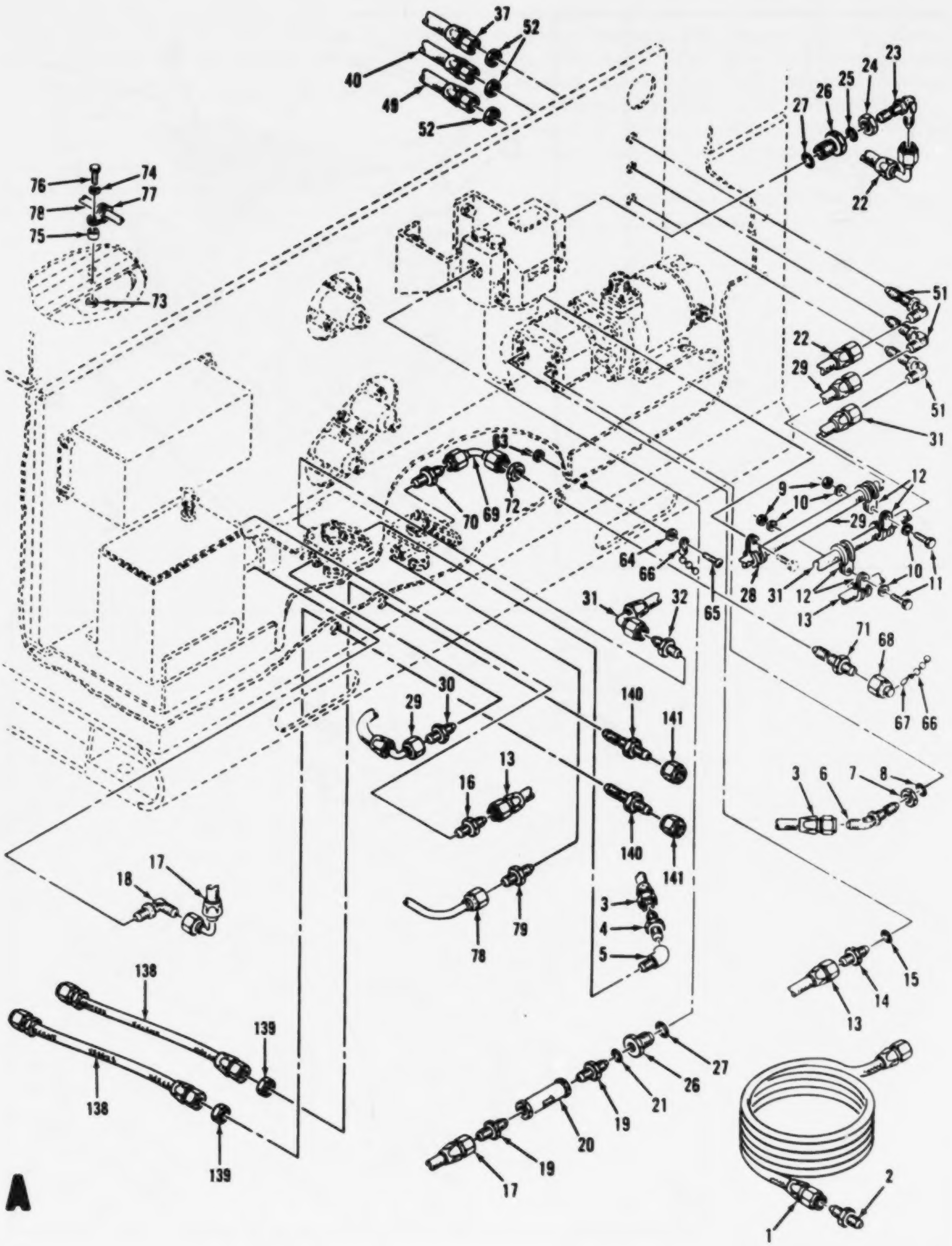
a. General. The hose and tube assemblies and plumbing fittings provide interconnection of fuel supply system components. Support clamps hold them in place. The hose assemblies consist of metallic braid protected hoses with appropriate end fittings permanently secured to the hose and metallic braid. The tube assemblies consists of formed metal tubes with standard sleeves and connection nuts, at the ends. Three check valves are located at strategic points within the fuel supply system to prevent possible reverse flow of fuel in the system.

b. Removal. Refer to figure 5-4 to remove the hose and tube assemblies.



ME 6115-339-34/5-4 ①

Figure 5-4. Hose and tube assemblies and plumbing fittings removal and installation. (Sheet 1 of 4).



ME 6115-339-34/5-4 ②

Figure 5-4. Hose and tube assemblies and plumbing fittings removal and installation. (Sheet 2 of 4).

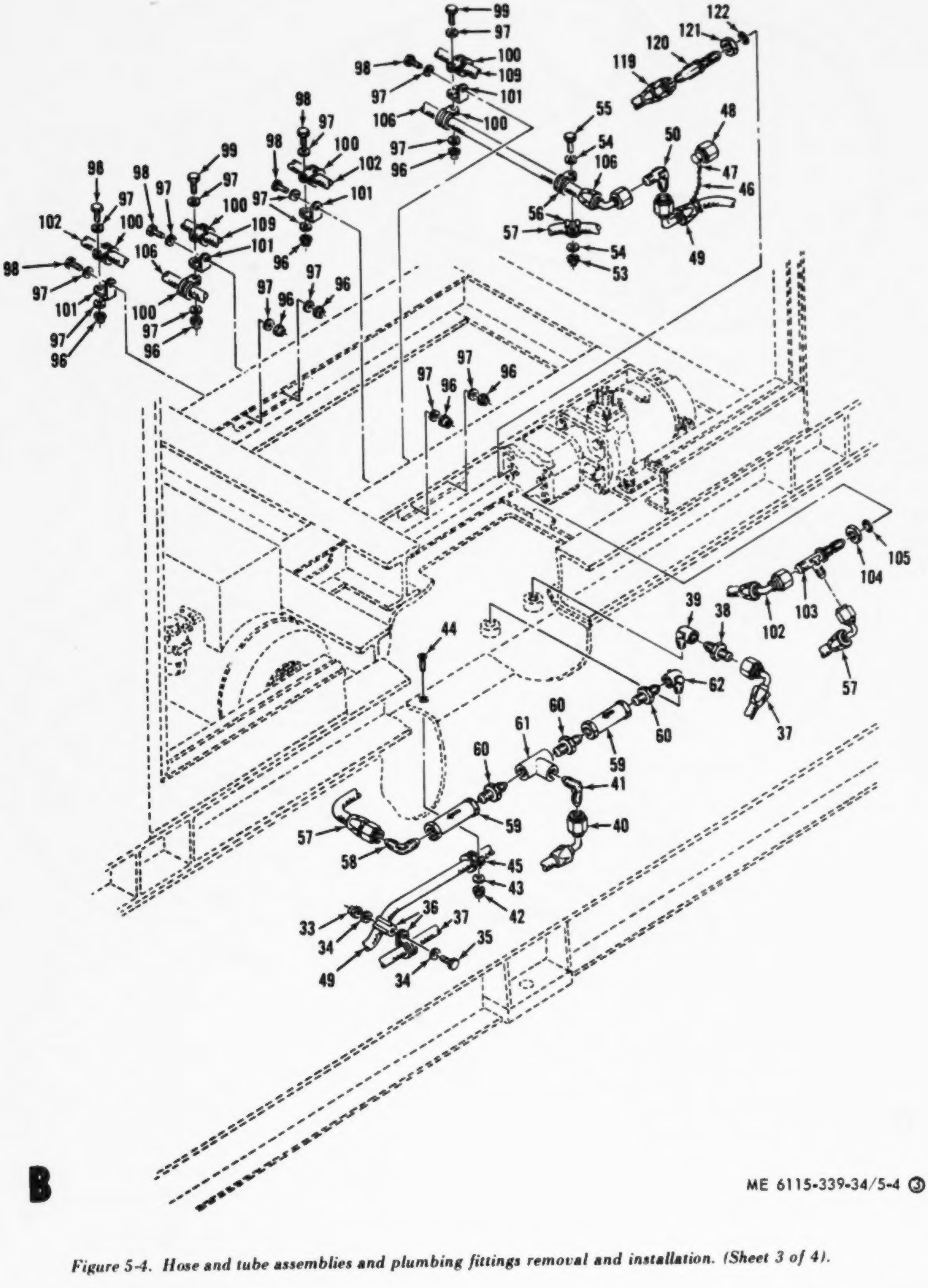
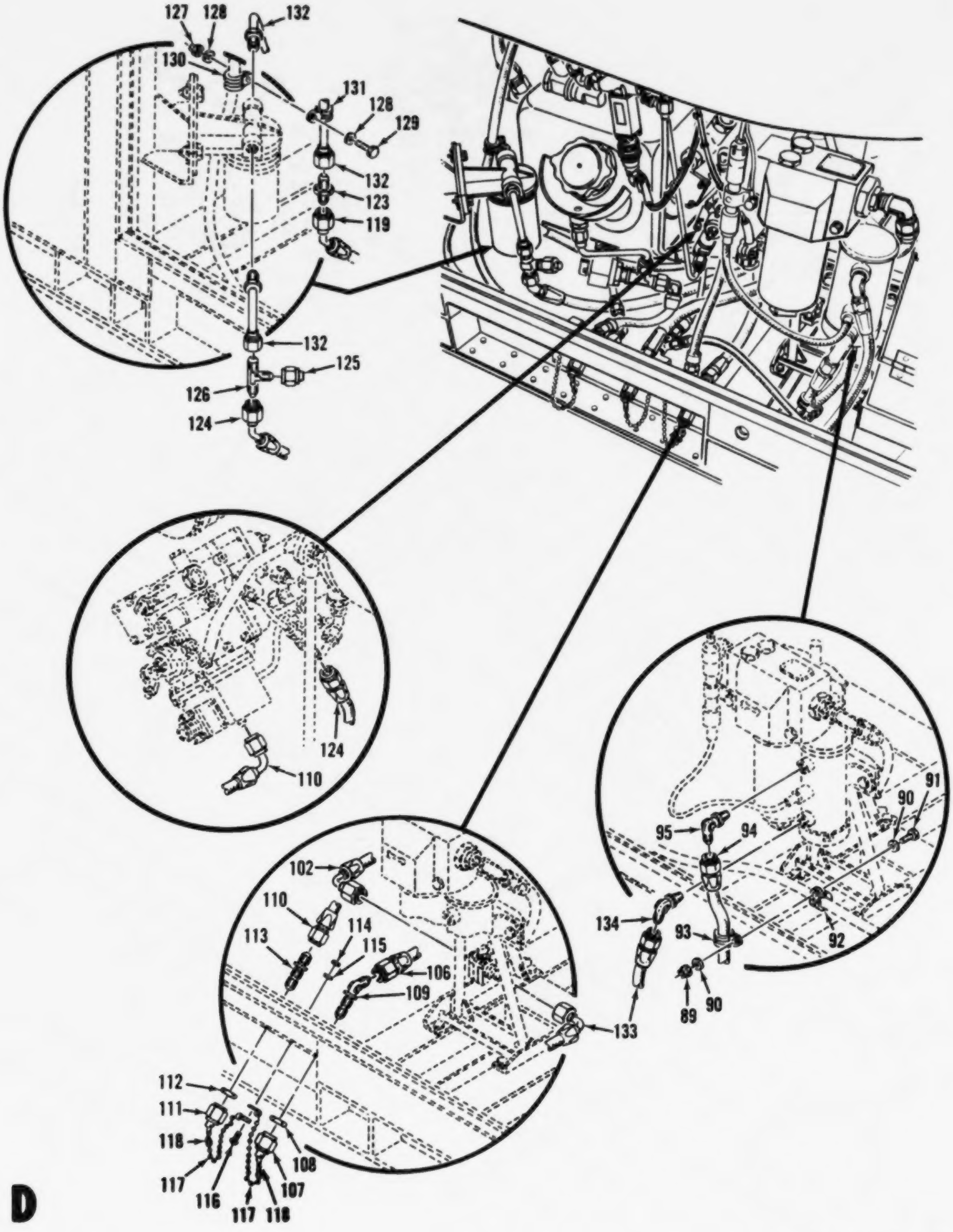


Figure 5-4. Hose and tube assemblies and plumbing fittings removal and installation. (Sheet 3 of 4).



ME 6115-339-34/5-4 ④

Figure 5-4. Hose and tube assemblies and plumbing fittings removal and installation. (Sheet 4 of 4).

Key to figure 5-4:
1. Hose assembly
2. Union
3. Hose assembly
4. Nipple
5. Elbow
6. Elbow
7. Nut
8. Packing
9. Nut (2)
10. Washer (4)
11. Bolt (2)
12. Clamp (4)
13. Hose assembly
14. Union
15. Packing
16. Nipple
17. Hose assembly
18. Elbow
19. Nipple (2)
20. Valve
21. Packing
22. Hose assembly
23. Elbow
24. Nut
25. Packing (2)
26. Bushing (2)
27. Packing (2)
28. Clamp
29. Hose assembly
30. Nipple
31. Hose assembly
32. Nipple
33. Nut
34. Washer (2)
35. Bolt
36. Clamp (2)
37. Hose assembly
38. Nipple
39. Elbow
40. Hose assembly
41. Elbow
42. Nut
43. Washer
44. Screw
45. Clamp
46. Chain assembly
47. Pin
48. Cap assembly
49. Hose assembly
50. Elbow
51. Elbow (3)
52. Nut (3)
53. Nut
54. Washer
55. Bolt
56. Clamp (2)
57. Hose assembly
58. Elbow
59. Valve (2)
60. Nipple (3)
61. Tee
62. Elbow
63. Nut
64. Washer
65. Screw
66. Chain assembly
67. Pin
68. Cap assembly
69. Tube assembly
70. Nipple
71. Union
72. Nut
73. Nut
74. Washer
75. Spacer
76. Screw
77. Clamp
78. Tube assembly
79. Nipple
80. Nut (2)
81. Washer (4)
82. Bolt (2)
83. Clamp (2)
84. Nut (4)
85. Washer (8)
86. Bolt (4)
87. Clamp (2)
88. Bracket (2)
89. Nut
90. Washer (2)
91. Bolt
92. Clamp
93. Clamp
94. Hose assembly
95. Elbow (2)
96. Nut (8)
97. Washer (16)
98. Bolt (6)
99. Bolt (2)
100. Clamp (6)
101. Bracket (4)
102. Hose assembly
103. Tee
104. Nut
105. Packing
106. Hose assembly
107. Cap assembly
108. Nut
109. Elbow
110. Hose assembly
111. Cap assembly
112. Nut
113. Union
114. Nut
115. Washer
116. Screw
117. Chain assembly (2)
118. Pin (2)
119. Hose assembly
120. Elbow
121. Nut
122. Packing
123. Union
124. Hose assembly
125. Cap assembly
126. Tee
127. Nut
128. Washer (2)
129. Bolt
130. Clamp
131. Clamp
132. Tube assembly (2)
133. Hose assembly
134. Elbow
135. Hose assembly
136. Elbow
137. Nut
*138. Hose assembly (2)
*139. Nut (2)
*140. Union (2)
*141. Nut (2)

*Used only on Part No. 13207E3830-3.

c. Cleaning, Inspection and Repair.

(1) Clean hose and tube assemblies and plumbing fittings with an approved cleaning solvent and dry thoroughly.

(2) Inspect all parts for any damage and replace a damaged component. Replace all packing.

d. Installation. Install hose and tube assemblies and plumbing fittings in reverse order of removal paying particular attention to the direction of flow of the arrow on the check valves.

CAUTION

Be sure fuel lines do not make physical contact with other surfaces of the generator set. The high frequency vibration of the equipment during operation may cause rapid wear and damage of the fuel lines leading to fuel system failure.

Section II. FUEL SUPPLY SYSTEM ACCESSORIES

5-4. General

This section contains repair instructions for those items which are considered accessories to the fuel supply system. They consist of the auxiliary fuel pump and motor assembly, high and low level float switch, low, low level float switch, auxiliary tank float switch, auxiliary tank bleed valve, main fuel pump and motor assembly, auxiliary tank assembly and the fuel tank.

5-5. Auxiliary Fuel Pump and Motor Assembly

a. General. The auxiliary fuel pump and motor assembly is a rotary gear-type pump driven by an integral 24 v dc electric motor. Output pressure is maintained at 15 +3/—0 psig by an adjustable pressure relief valve. Operation of the fuel pump and motor assembly is automatically controlled by the auxiliary tank float switch, high level float switch and the low level float switch.

b. Removal and Installation. Refer to TM 5-6115-339-12 to remove and install the auxiliary fuel pump and motor assembly.

c. Cleaning, Inspection. Refer to TM 5-6115-339-12 for cleaning and inspection instructions.

d. Bench Test.

(1) Attach a pressure gage (0 to 30 psi) and a rotometer (0 to 200 pounds per minute) to fuel pump outlet.

(2) Supply a source of filtered calibrating fluid (Military Specification MIL-F-7024, Type II) to fuel pump inlet.

(3) Apply 24v dc to fuel pump motor and observe pressure gage and rotometer. Relief valve pressure must be 15 +3/—0 while pump is discharging at 120 pounds per hour. Repeat procedures by applying 14v dc.

(4) If relief valve adjustment is necessary, remove acorn nut on side of pump housing and turn relief valve adjustment screw accordingly until specified pressure is obtained.

(5) While pump is operating check for leakage at bypass valve and relief valve gaskets. No leakage is permitted.

(6) Reinstall acorn nut and lockwire to secure adjustment.

5-6. High Level Float Switch

a. General. The high level float switch (12, fig. 5-5) is installed in the upper portion of the fuel tank assembly and actuates to shut down the auxiliary fuel pump when the fuel tank is full. The switch is a two-position switch, actuated by a float. Actuation occurs when float level is $\frac{1}{4} \pm \frac{1}{8}$ above centerline of switch and reactuates at 15/16-inch maximum below point established by rising actuation.

b. Removal.

(1) Disconnect electrical wiring harness connector at high level float switch (12).

(2) Remove bolts (10), washers (11), and switch (12) with packing (13).

c. Cleaning, Inspection and Repair.

(1) Clean high level float switch with a clean cloth moistened in approved cleaning solvent and allow to dry.

(2) Inspect for bent or loose pins in switch connector.

(3) Inspect switch float for binding.

(4) Check for continuity through switch connector pins.

d. Installation. Install high level float switch in reverse order of removal procedure using new packing (13), making certain that switch is oriented correctly on fuel tank.

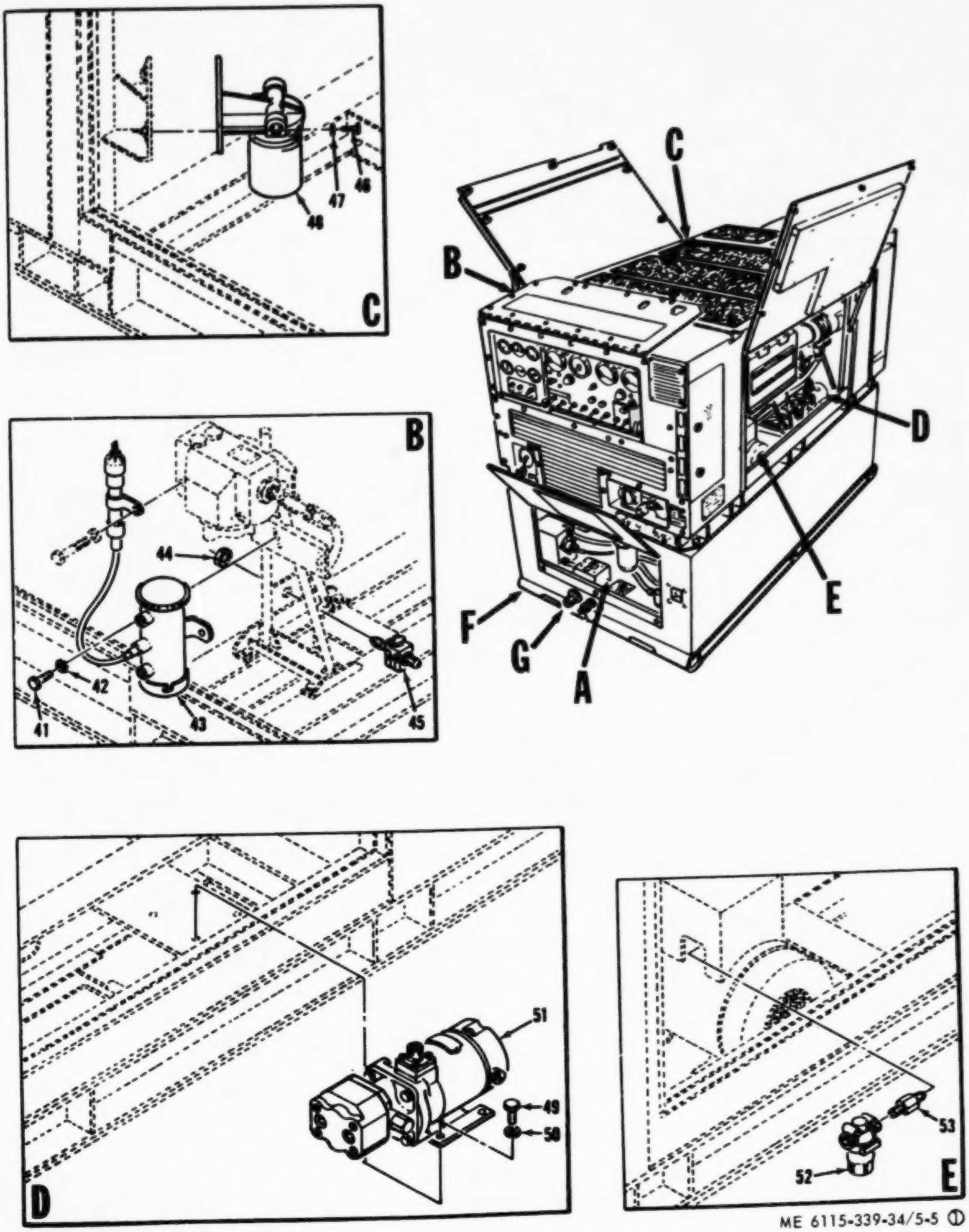
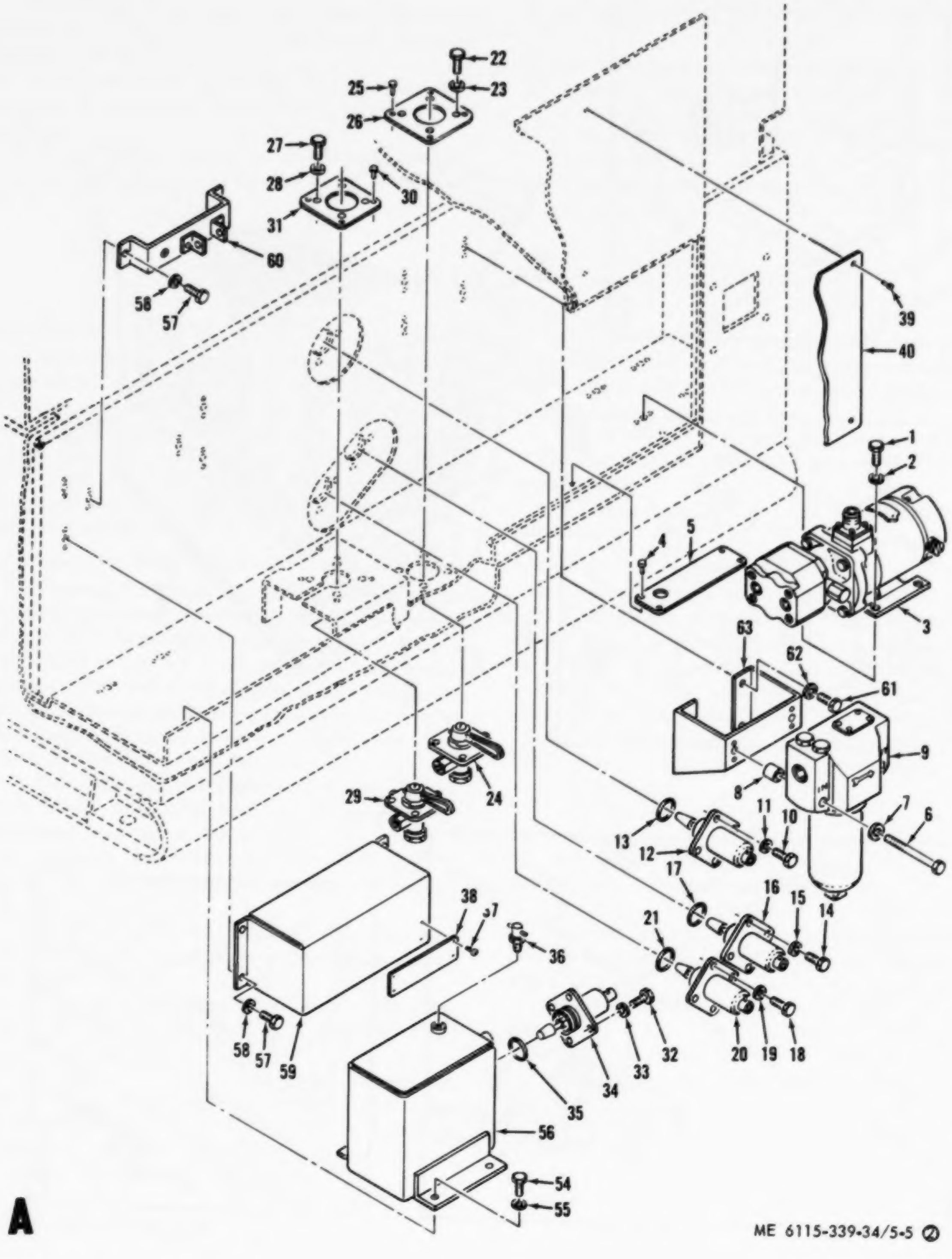


Figure 5-5. Fuel supply system accessories removal and installation. (Sheet 1 of 4).



ME 6115-339-34/5-5 ②

Figure 5-5. Fuel supply system accessories removal and installation. (Sheet 2 of 4).

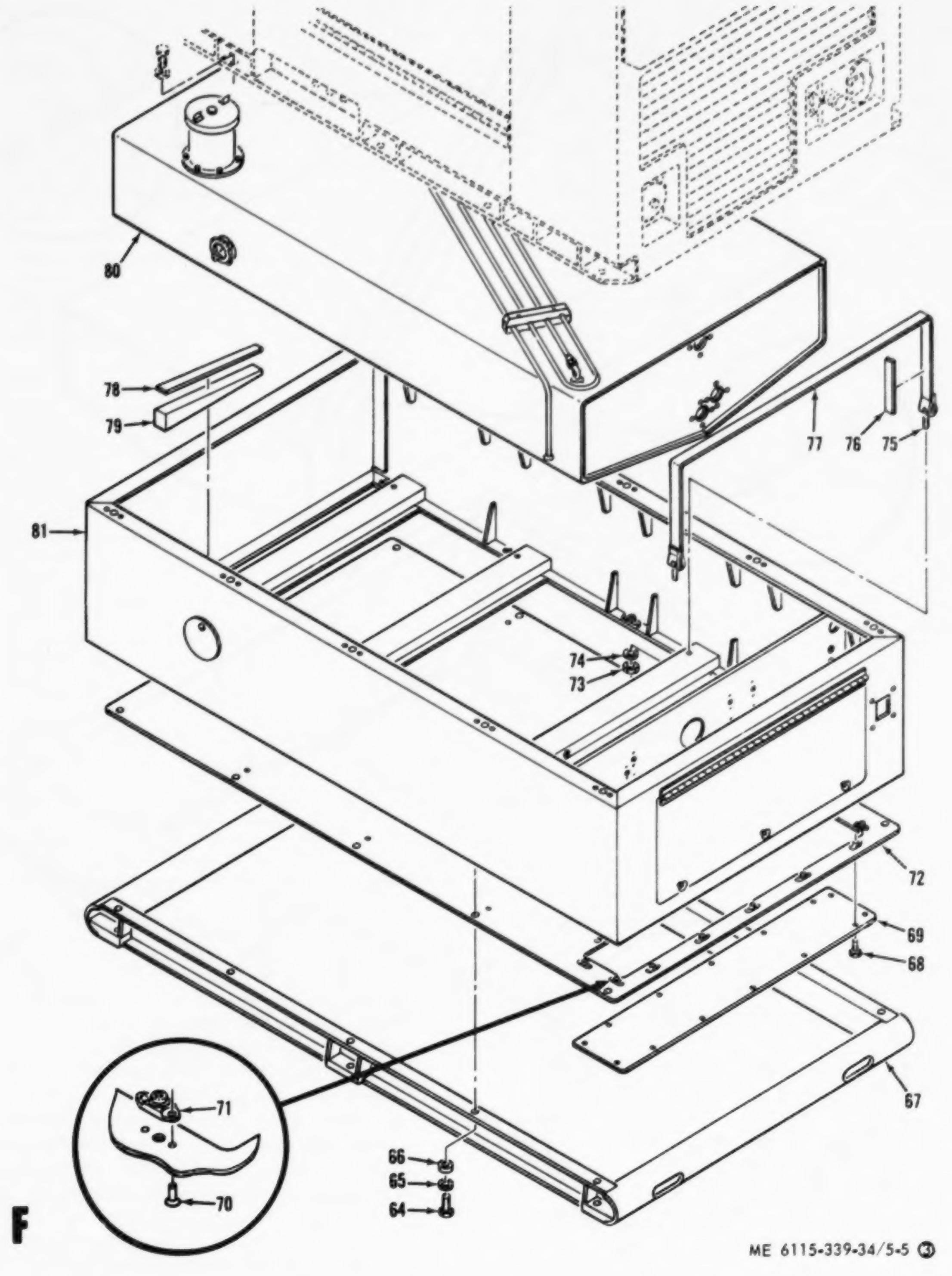
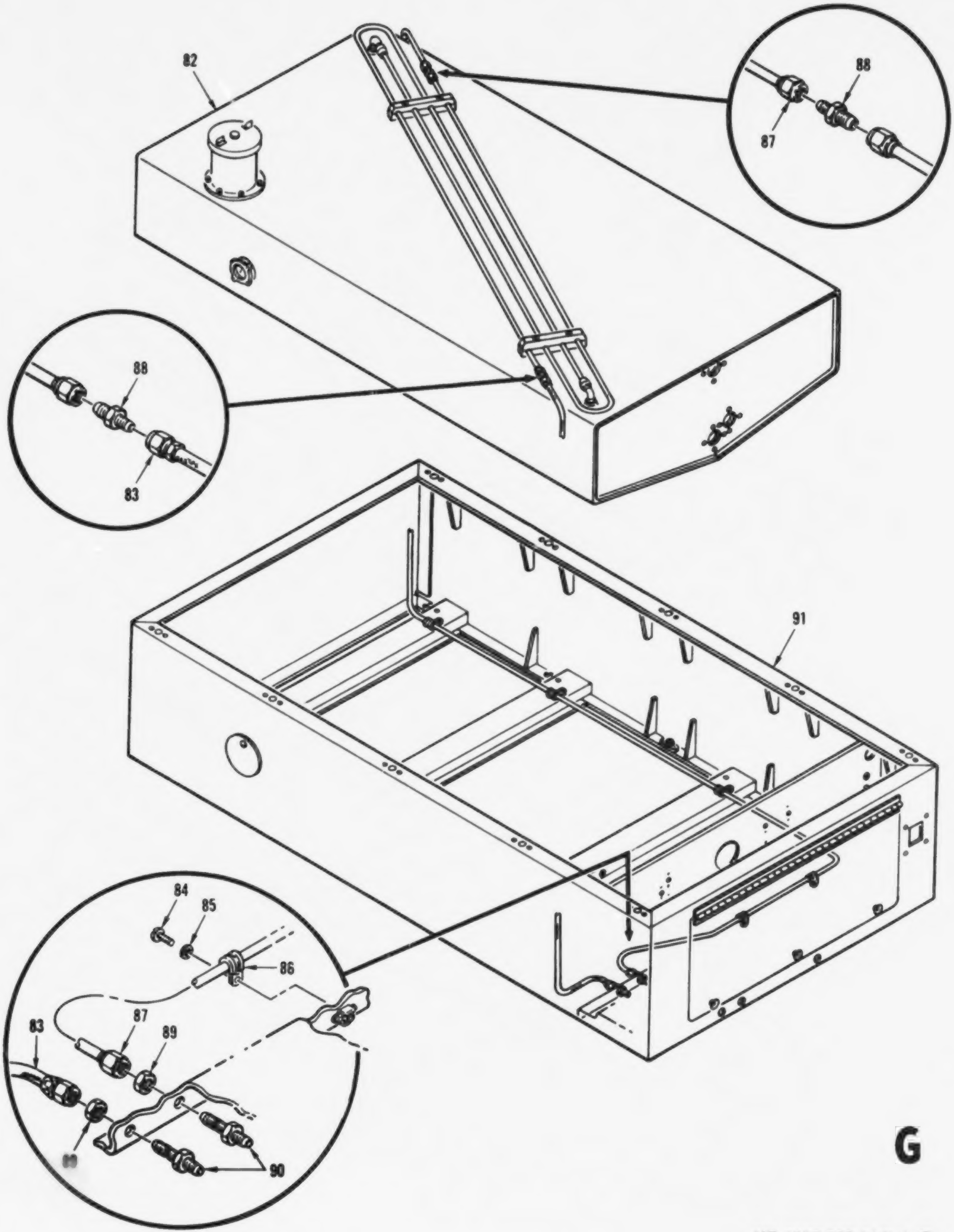


Figure 5-5. Fuel supply system accessories removal and installation. (Sheet 3 of 4).



ME 6115-339-34/5-5 ④

Figure 5-5. Fuel supply system accessories removal and installation. (Sheet 4 of 4).

Key to figure 5-5:

1. Bolt (4)
2. Washer (4)
3. Auxiliary fuel pump and motor assembly
4. Rivet (4)
5. Priming switch label
6. Bolt (2)
7. Washer (2)
8. Spacer (2)
9. Fuel tank fuel filter assembly
10. Bolt (4)
11. Washer (4)
12. High level float switch
13. Packing
14. Bolt (4)
15. Washer (4)
16. Low level float switch
17. Packing
18. Bolt (4)
19. Washer (4)
20. Low Low Level float switch
21. Packing
22. Bolt (4)
23. Washer (4)
24. Fuel drain valve
25. Rivet (4)
26. Fuel drain valve label
27. Bolt (4)
28. Washer (4)
29. Fuel selector valve
30. Rivet (4)
31. Fuel selector valve label
32. Bolt (4)
33. Washer (4)
34. Auxiliary tank float switch
35. Packing
36. Auxiliary tank bleed air valve
37. Screw (4)
38. Bleed air valve label
39. Rivet (4)
40. Plumbing and electrical schematic label
41. Bolt (2)
42. Washer (2)
43. Battery heater fuel pump
44. Nut
45. Heater fuel shutoff valve
46. Bolt (2)
47. Washer (2)
48. Main fuel filter assembly
49. Bolt (4)
50. Washer (4)
51. Main fuel pump and motor assembly
52. Heater fuel filter assembly
53. Nipple
54. Bolt (4)
55. Washer (4)
56. Auxiliary tank assembly
57. Bolt (6)
58. Washer (6)
59. Cover
60. Bracket
61. Bolt (4)
62. Washer (4)
63. Bracket
64. Bolt (10)
65. Washer (10)
66. Washer (10)
67. Base frame assembly
68. Screw (14)
69. Stone shield cover
70. Rivet (28)
71. Nut Plate (14)
72. Stone shield skin
73. Nut (8)
74. Washer (8)
75. Tee bolt (8)
76. Neoprene strip liner (4)
77. Strap (4)
78. Neoprene strip liner (8)
79. Tank support block (8)
80. Fuel tank assembly
81. Tank enclosure assembly

*82. Fuel tank assembly
*83. Hose assembly
*84. Screw (5)
*85. Washer (5)
*86. Clamp (5)
*87. Tube assembly
*88. Reducer (2)
*89. Nut (2)
*90. Union (2)
*91. Tank enclosure assembly

* Used only on Part No. 13207E3830-3.

5-7. Low Level Float Switch

a. General. The low level float switch (16, fig. 5-5) is installed in the lower portion of the fuel tank assembly. It senses the low fuel level and provides bias voltage to the controlled rectifier which permits reactivation of the auxiliary pump. The switch is a two-position switch, actuated by a float. Actuation occurs when float level is ¼ ±⅛ inch above centerline of switch and reactuates at 15/16-inch maximum below point established by rising actuation.

b. Removal.

(1) Disconnect electrical wiring harness connector at low level float switch (16).

(2) Remove bolts (14), washers (15), and switch (16) with packing (17).

c. Cleaning, Inspection and Repair.

(1) Clean low level float switch with a clean cloth moistened in approved cleaning solvent and allow to dry.

(2) Inspect for bent or loose pins in switch connector.

(3) Inspect switch float for binding.

(4) Check for continuity through switch connector pins.

d. Installation. Install low level float switch in reverse order of removal procedure using new packing (17), making certain that switch is oriented correctly on fuel tank.

5-8. Low Low Level Float Switch

a. General. The low low level float switch (20, fig. 5-5) is installed in the lowest portion of the fuel tank assembly and actuates with decreasing fuel level to open a holding circuit to the gas turbine engine. The switch is a two-position switch actuated by a float. Actuation occurs when float level is

¼ ± ⅛ inch above centerline of switch and reactuates at 15/16 inch maximum below point established by rising actuation.

b. Removal.

(1) Disconnect electrical wiring harness connector at low low level float switch (20).

(2) Remove bolts (18), washers (19), and switch (20) with packing (21).

c. Cleaning, Inspection, and Repair.

(1) Clean low low level float switch with a clean cloth moistened in approved cleaning solvent and allow to dry.

(2) Inspect for bent or loose pins in switch connector.

(3) Inspect float for binding.

(4) Check for continuity through switch connector pins.

d. Installation. Install low low level float switch in reverse order of removal procedure using new packing (21), making certain that switch is oriented correctly on fuel tank.

5-9. Auxiliary Tank Float Switch

a. General. The auxiliary tank float switch (34, fig. 5-5) is installed in the lower portion of the auxiliary tank assembly and provides auxiliary fuel pump protection by shutting off the pump in the event the external fuel supply is depleted. The switch opens the electrical circuit to the pump motor when the auxiliary tank is empty and closes the circuit to the low fuel warning light.

b. Removal.

(1) Disconnect electrical wiring harness connector at auxiliary tank float switch (34).

(2) Remove bolts (32), washers (33), and switch (34) with packing (35).

c. Cleaning, Inspection, and Repair.

(1) Clean auxiliary tank float switch with a clean cloth moistened in approved cleaning solvent and allow to dry.

(2) Inspect for bent or loose pins in switch connector.

(3) Inspect switch float for binding.

(4) Check for continuity through switch connector pins.

d. Installation. Install auxiliary tank float switch in reverse order of removal procedure using new packing (35).

5-10. Auxiliary Tank Bleed Air Valve

a. General. The auxiliary tank bleed air valve (36, fig. 5-5) is a manually operated valve installed in the top of the auxiliary tank and provides air bleed until the tank is filled with fuel.

b. Removal. Unscrew bleed air valve and remove from top of auxiliary tank.

c. Cleaning, Inspection and Repair.

(1) Clean bleed air valve with an approved cleaning solvent and allow to dry.

(2) Inspect bleed air valve for obstruction and for freedom of operation.

d. Installation. Coat threads of bleed air valve with sealant, then install bleed air valve in reverse order of removal procedure using figure 5-5.

5-11. Main Fuel Pump and Motor Assembly

a. General. The main fuel pump and motor assembly (51, fig. 5-5) is a rotary gear-type pump driven by a 24v dc electric motor. Output pressure is maintained at 15 +3/—0 psig by an adjustable pressure relief valve. The main fuel pump delivers fuel to the gas turbine engine at a constant pressure from an external source or from the fuel tank assembly. Operation of the pump is initiated when the MASTER switch is placed in the RUN position and continues to run until the switch is turned off.

b. Removal and Installation. Refer to TM 5-6115-339-12 to remove and install this main fuel pump and motor assembly.

c. Cleaning and Inspection. Refer to TM 5-6115-339-12 for cleaning and inspection instructions.

d. Bench Test. Refer to paragraph 5-5 *d* for bench test procedures.

5-12. Auxiliary Tank Assembly

a. General. The auxiliary tank assembly (56, fig. 5-5) is a welded aluminum rectangular tank and provides for an auxiliary supply of fuel when the external fuel supply is depleted.

b. Removal.

(1) Disconnect fuel lines at auxiliary tank assembly (56).

(2) Remove auxiliary tank float switch (34) in accordance with paragraph 5-9.

(3) Remove auxiliary tank bleed air valve (36) in accordance with paragraph 5-10.

(4) Remove bolts (54), washers (55), and auxiliary tank assembly (56) from tank enclosure assembly (81).

c. Cleaning, Inspection, and Repair.

(1) Flush tank assembly internally with an approved cleaning solvent; clean tank assembly externally with a cloth moistened with an approved cleaning solvent.

(2) Inspect tank assembly for broken welds and damaged or loose fittings.

(3) Apply an inlet pressure of 3.0 psig to tank assembly, with all other openings capped or plugged air tight, and check for leakage. No leakage is allowed. Upon completion of pressure check, flush tank assembly internally with a corrosion preventative oil conforming to Military Specification MIL-C-4339.

d. Installation. Install auxiliary tank assembly in reverse order of removal procedure using figure 5-5.

5-13. Fuel Tank Assembly

a. General. The fuel tank assembly (80, fig. 5-5) consists basically of a fuel storage tank and fuel level gage. The fuel storage tank is a rectangular welded aluminum tank with a capacity of 65 gallons. The tank is enclosed and supported by the tank enclosure assembly (81). A non-siphoning, flame-arresting vent system provides venting of the tank in any position. On generator sets Part No. 13207E383D, the vent system is identical except remote venting is provided through fittings located on the front of the enclosure. The bottom of the tank is constructed to slope to a common sump to permit draining. A filter neck with cap and captive strainer assembly is provided for manual filling of the tank. The tank structure provides for mounting a fuel level gage, high level float switch, low level float switch, low low level float switch, fuel drain fitting, fuel in fitting, and a fuel out fitting. The fuel level gage is a float actuated dial pointer gage calibrated to indicate fuel depth in the fuel storage tank. The gage is graduated in sixteenths from empty (E) to full (F), with ¼ full, ½ full, and ¾ full points identified. The gage is installed in the side of the fuel storage tank and is protected by a movable cover on the tank enclosure assembly.

b. Removal.

(1) Disconnect all fuel lines from fuel tank assembly.

(2) Remove all fuel supply system accessories that are attached to the fuel tank assembly in accordance with applicable paragraphs in this section.

(3) Remove bolts (64) and washers (65, 66) and separate base frame assembly (67) and stone shield assembly (68-72) from tank enclosure assembly (81).

(4) Remove nuts (73), washers (74), and straps (77), then carefully remove, tank assembly (80) from tank enclosure assembly (81).

c. Disassembly. Disassemble fuel tank assembly according to sequence of index numbers assigned to figure 5-6.

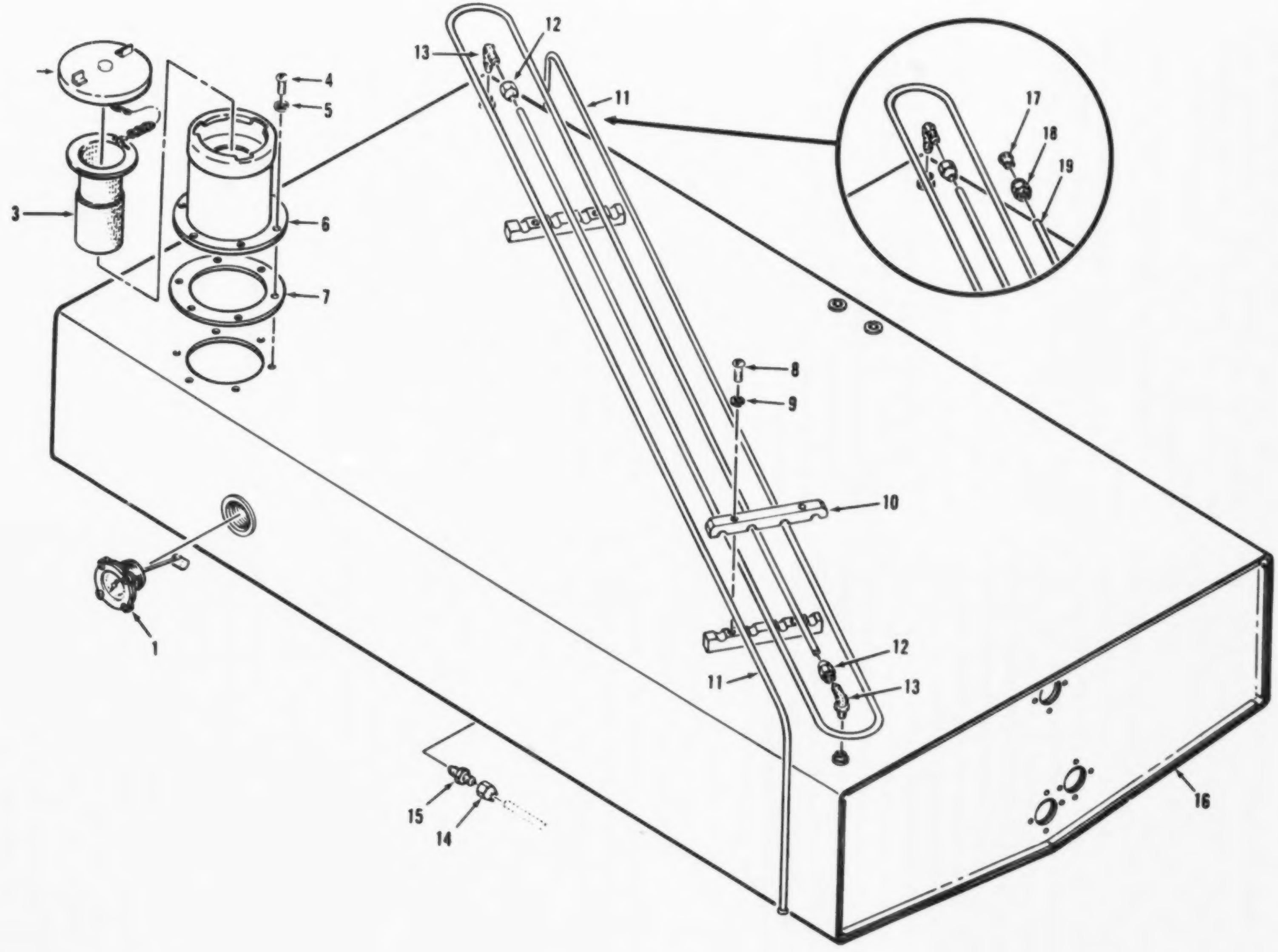


Figure 5-6. Fuel tank assembly, exploded view.

Key to figure 5-6:

1. Fuel level gage
2. Fuel tank cap
3. Strainer assembly
4. Screw (6)
5. Washer (6)
6. Filler neck assembly
7. Gasket
8. Screw (4)
9. Washer (4)
10. Tube hold down (2)
11. Vent tube (2)
12. Nut (2)
13. Elbow (2)
14. Nut
15. Nipple
16. Tank assembly (welded)
***17. Sleeve (2)**
***18. Nut (2)**
***19. Vent (2)**

* Used only on part No. 13207E3830-3

d. Cleaning, Inspection, and Repair.

(1) Clean all metallic parts with approved cleaning solvent, and flush tank assembly (16) internally with approved cleaning solvent.

(2) Inspect operation of fuel level gage (1) by moving gage float through entire travel.

(3) Inspect strainer assembly (3) for damage to wire screen.

(4) Inspect vent tubes (11) for obstructions, kinks, breaks, or other damage. On generator sets bearing Part No. 13207E3830-1 and 13207E3830-2, inspect flame arrester screens in vent and end of tubes for breaks in screen and security of installation.

(5) Inspect tank assembly (16) for broken welds and damaged or loose fittings.

(6) Apply an inlet pressure of 3.0 psig to tank assembly, with all other openings capped or plugged air tight, and check for leakage. No leakage is allowed. Upon completion of pressure check, flush tank assembly internally with a corrosion preventative oil conforming to Military Specification MIL-C-4339.

(7) Inspect neoprene strips (76, 78, fig. 5-5) for deterioration and other damage. If replacement of strips is necessary, install new strips on straps (77) on support blocks (79) using adhesive.

(8) Inspect support blocks (79), for damage. If blocks are loose, secure to tank enclosure assembly ribs using adhesive.

e. Reassembly. Assemble fuel tank assembly in reverse order of disassembly using figure 5-6. Apply antiseize compound to all threaded connections, and apply a coat of sealant to both sides of gasket (7).

f. Installation. Install fuel tank assembly in reverse order of removal procedure using figure 5-5.

5-14. Tank Enclosure Assembly

a. General. The tank enclosure assembly (81, fig. 5-5) is a welded aluminum structure providing support, protection, and mounting provisions for components of the fuel supply system. The enclosure structure provides mounting holes for securing the skid-type base frame assembly and for attaching the fuel tank assembly to the generator set. A spring-loaded door assembly provides access to, and protection for, components located in the front section of the enclosure.

b. Removal and Installation. Refer to figure 5-5 to remove and install the tank enclosure assembly.

NOTE

Removal of cover (59) and brackets (60, 63) is not required unless damage is indicated by inspection.

c. Disassembly. Refer to figure 5-7 to disassemble the tank enclosure assembly.

NOTE

Disassembly should be accomplished only to that extent indicated by inspection.

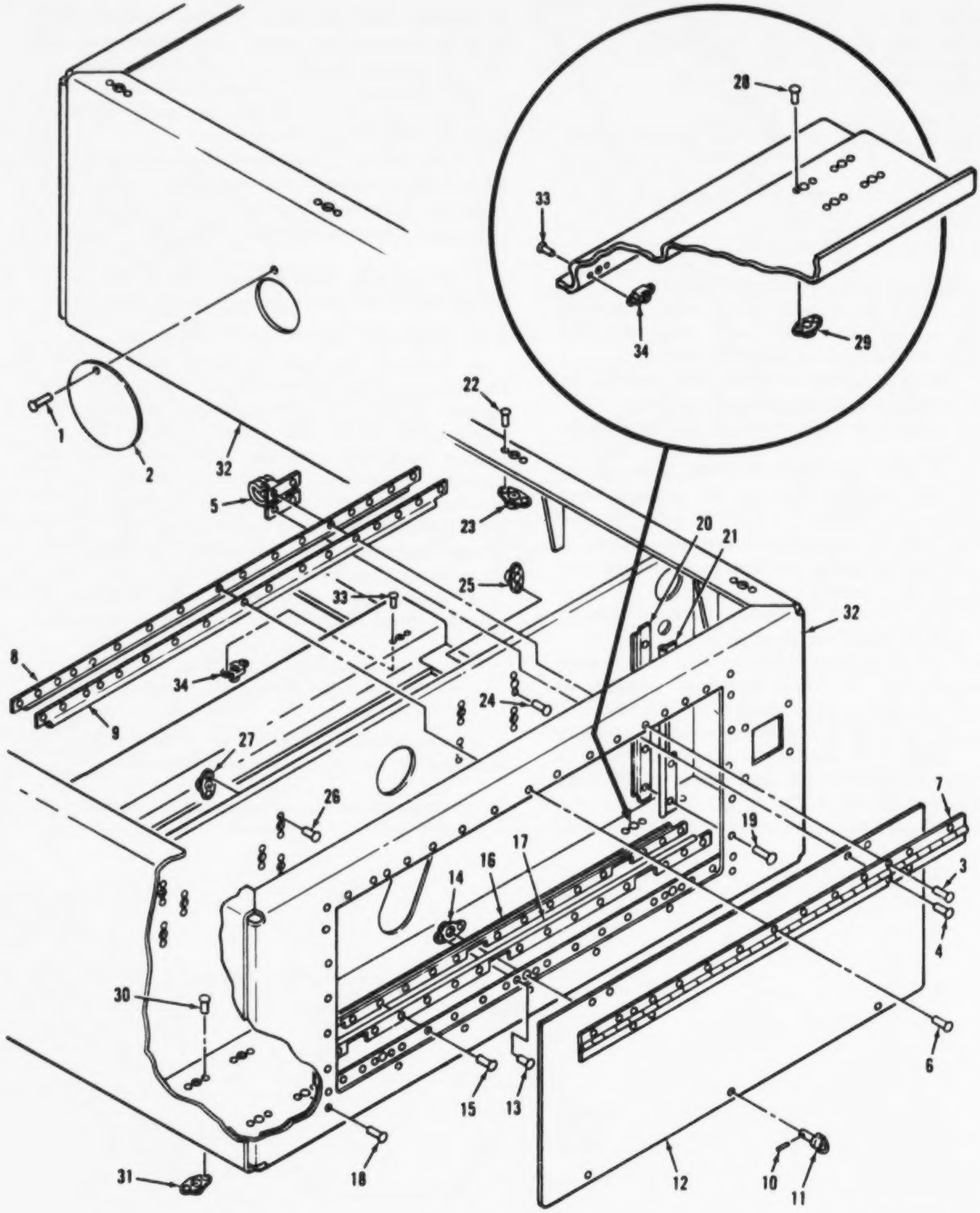


Figure 5-7. Tank enclosure assembly, exploded view.

Key to figure 5-7:

1. Rivet
2. Door
3. Rivet (4)
4. Rivet (4)
5. Door retainer spring (2)
6. Rivet (11)
7. Hinge
8. Retainer
9. Seal
10. Cross pin (3)
11. Stud (3)
12. Door, access
13. Rivet (6)
14. Receptacle (3)
15. Rivet (14)
16. Retainer
17. Seal
18. Rivet (7)
19. Rivet (14)
20. Retainer (2)
21. Seal (2)
22. Rivet (40)
23. Nut plate (20)
24. Rivet (8)
25. Nut plate (4)
26. Rivet (12)
27. Nut plate (6)
28. Rivet (8)
29. Nut plate (4)
30. Rivet (8)
31. Nut plate (4)
32. Enclosure assembly (welded)

*33. Rivet (10)
*34. Nut plate (5)

*Used only on Part No. 13207E3830-3.

d. Cleaning, Inspection and Repair.

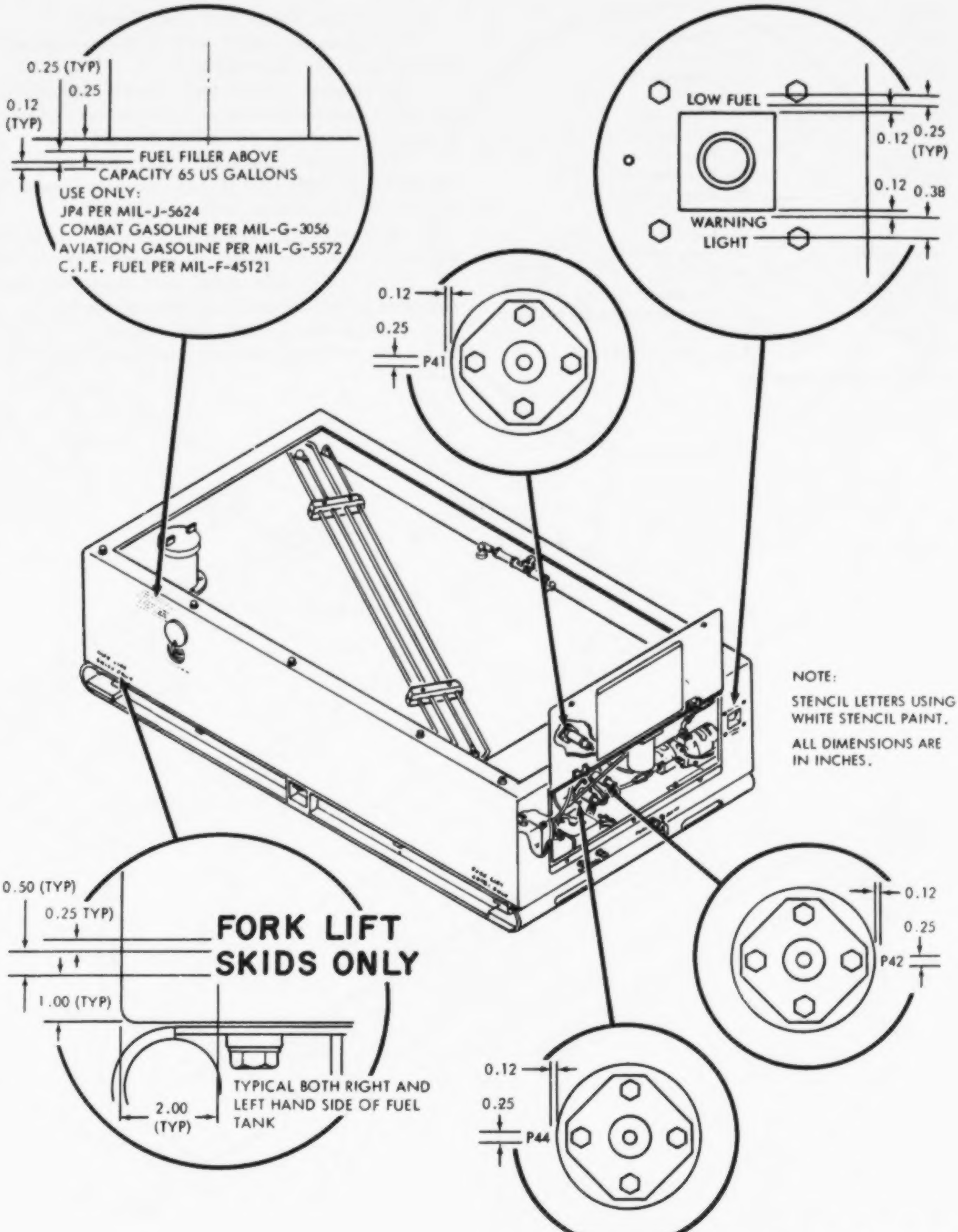
(1) Clean all parts with approved cleaning solvent and dry thoroughly.

(2) Inspect doors and panels for cracks, breaks, deterioration or protective coating, damaged fasteners, and other defects.

(3) Inspect painted data on enclosure assembly for legibility. If data requires repainting, repaint in accordance with figure 5-8.

e. Reassembly. Assemble tank enclosure assembly in reverse order of disassembly. If seals (9, 17, 21, fig. 5-7) have been replaced, apply adhesive to both sides of seal prior to assembly.

f. Installation. Install tank enclosure assembly in reverse order of removal procedure using figure 5-5.



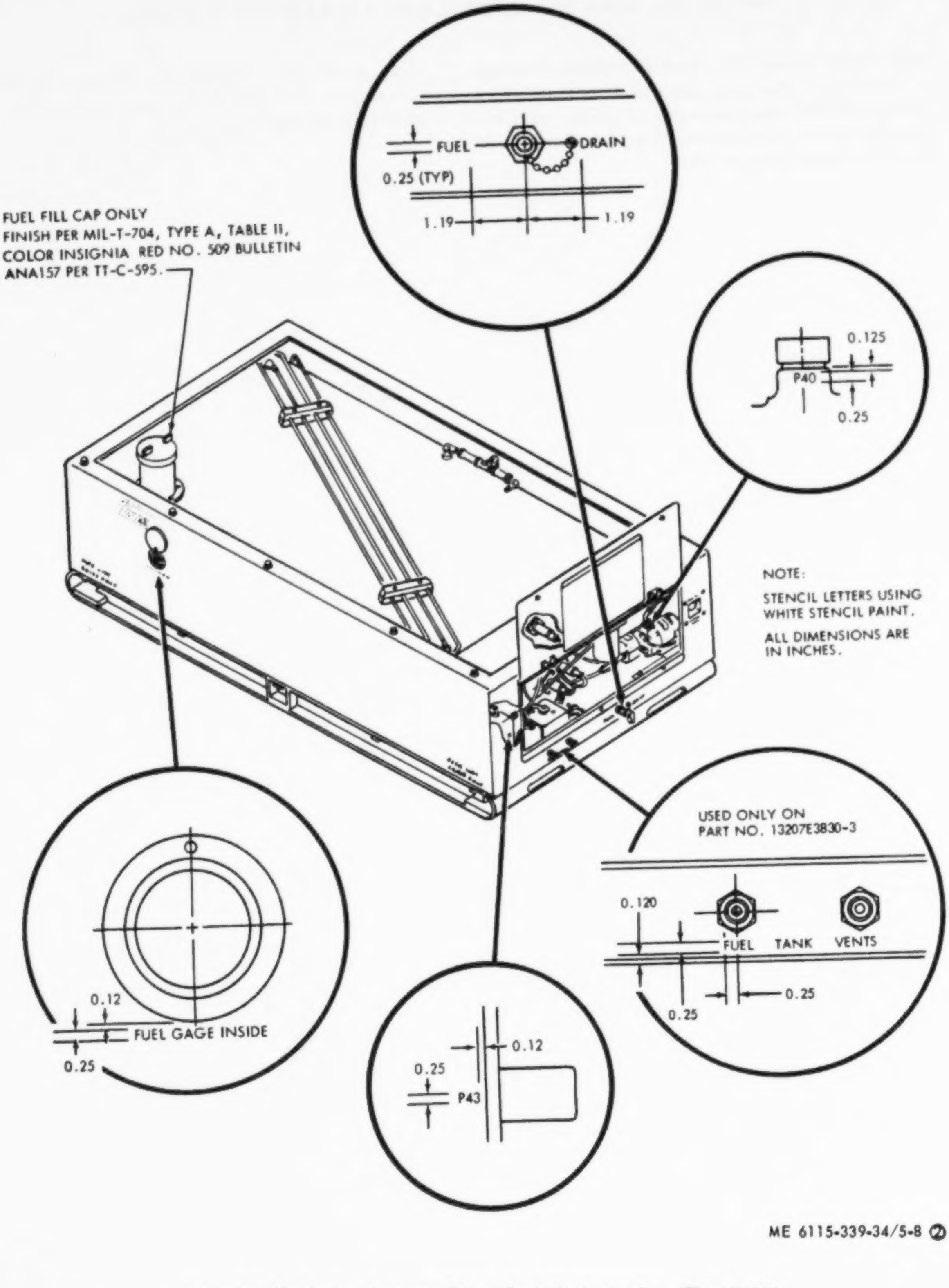
NOTE:

STENCIL LETTERS USING WHITE STENCIL PAINT.

ALL DIMENSIONS ARE IN INCHES.

ME 6115-339-34/5-8 ①

Figure 5-8. Fuel tank enclosure marking and painting instructions. (Sheet 1 of 2).



FUEL FILL CAP ONLY
FINISH PER MIL-T-704, TYPE A, TABLE II,
COLOR INSIGNIA RED NO. 509 BULLETIN
ANA157 PER TT-C-595.

NOTE:

STENCIL LETTERS USING WHITE STENCIL PAINT.

ALL DIMENSIONS ARE IN INCHES.

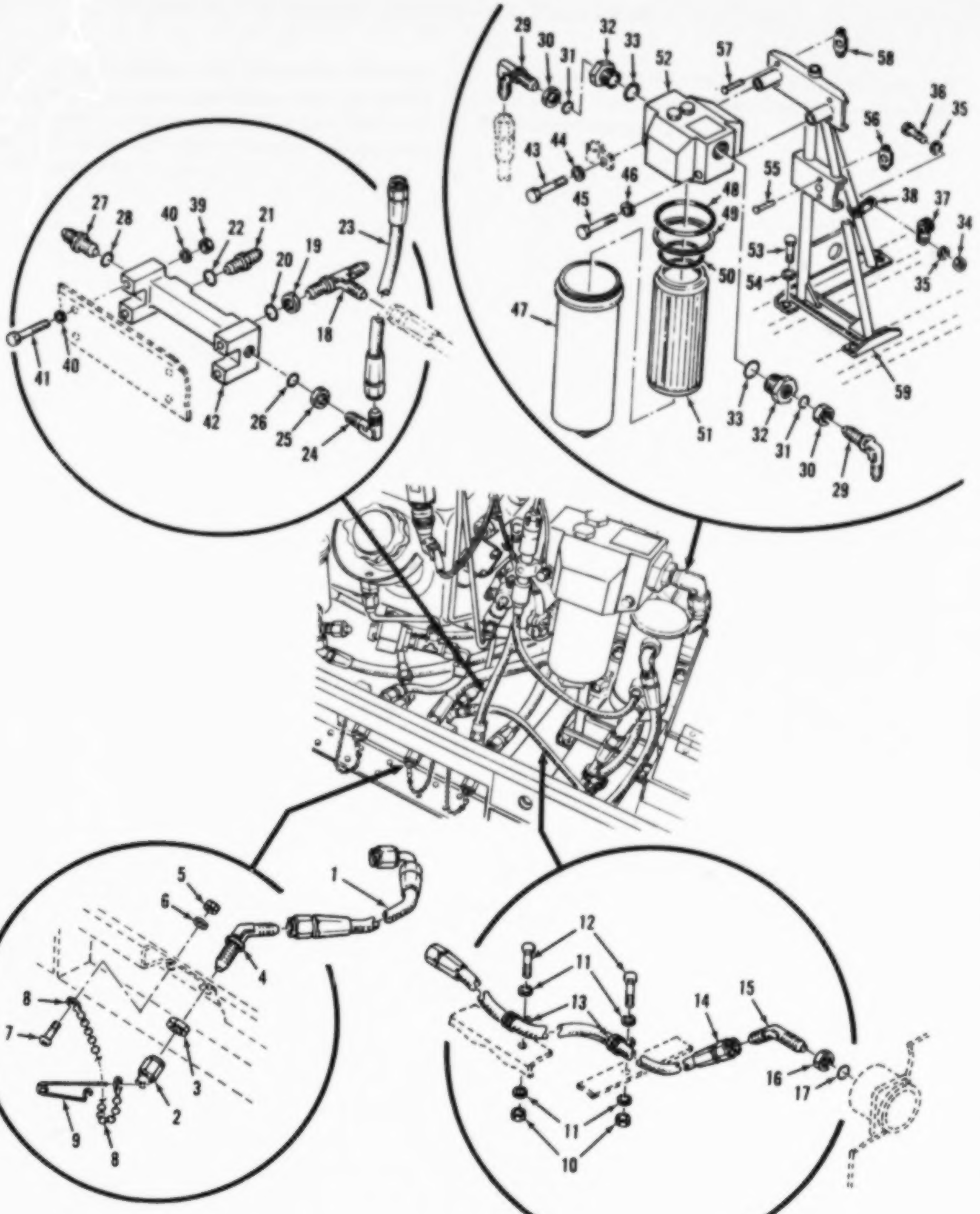
ME 6115-339-34/5-8 ②

Figure 5-8. Fuel tank enclosure marking and painting instructions. (Sheet 2 of 2).

5-15. Hose Assemblies and Plumbing Fittings

a. General. The hose assemblies and plumbing fittings provide interconnection of engine lubricant filtering system components. Support clamps hold the hose assemblies in place.

b. Removal and Installation. Refer to figure 5-9 to remove and install the hose assemblies and plumbing fittings.



ME 6115-339-34/5-9

Figure 5-9. Engine lubricant filtering system, exploded view.

Key to figure 5-9:
1. Hose assembly
2. Cap assembly
3. Nut
4. Elbow
5. Nut
6. Washer
7. Screw
8. Chain assembly
9. Pin
10. Nut (2)
11. Washer (4)
12. Bolt (2)
13. Clamp (2)
14. Hose assembly
15. Elbow
16. Nut
17. Packing
18. Tee
19. Nut
20. Packing
21. Union
22. Packing
23. Hose assembly
24. Elbow
25. Nut
26. Packing
27. Union
28. Packing
29. Elbow (2)
30. Nut (2)
31. Packing (2)
32. Bushing (2)
33. Packing (2)
34. Nut
35. Washer (2)
36. Bolt
37. Clamp
38. Clamp
39. Nut (4)
40. Washer (8)
41. Screw (4)
42. Manifold
43. Bolt
44. Washer
45. Bolt
46. Washer
47. Filter cover
48. Packing
49. Backup retainer
50. Packing
51. Filter element
52. Filter housing
53. Bolt (4)
54. Washer (4)
55. Rivet (4)
56. Nutplate (2)
57. Rivet (4)
58. Nut plate (2)
59. Oil filter stand assembly (welded)

NOTE

If required, dependent upon location of hose assembly, drain lubricating system prior to removal.

c. Cleaning and Inspection.

(1) Clean hose assemblies and plumbing fittings with an approved cleaning solvent and dry thoroughly with filtered compressed air.

(2) Inspect all threaded parts for stripped, crossed, or peened threads. If threads are damaged beyond simple repair, replace the part.

(3) Inspect hose assemblies for cracks, breaks, chafing, and damage to hose interior. If damaged replace hose assembly.

(4) Inspect plumbing fittings for cracks and clogged passages. Clean clogged passages and replace cracked fittings.

(5) Replace all packings at each overhaul regardless of condition.

CAUTION

Be sure lubricating lines do not make physical contact with other surfaces of the generator set. The high frequency vibration of the equipment during operation may cause wear and damage of the lubricating lines leading to lubricating system failure.

5-16. Oil Filter Assembly

a. General. The oil filter assembly (47-52, fig. 5-9) filters all lubricating oil between the oil pump assembly pressure pump and engine lubrication points. A 50 to 55 psi bypass valve in the filter housing provides a safety bypass for lubricating oil in the event the filter element becomes clogged.

b. Removal and Installation. Refer to TM 5-6115-339-12 to remove and install the oil filter assembly.

c. Bench Test. Supply a source of system lubricating oil to inlet on filter housing. Increase inlet pressure until bypass valve opens (indicated) by a sudden drop in pressure), which shall be 50 to 55 psig. Replace filter assembly if bypass valve opening pressure is not within limits.

CHAPTER 6

REPAIR OF WINTERIZATION EQUIPMENT

6-1. General

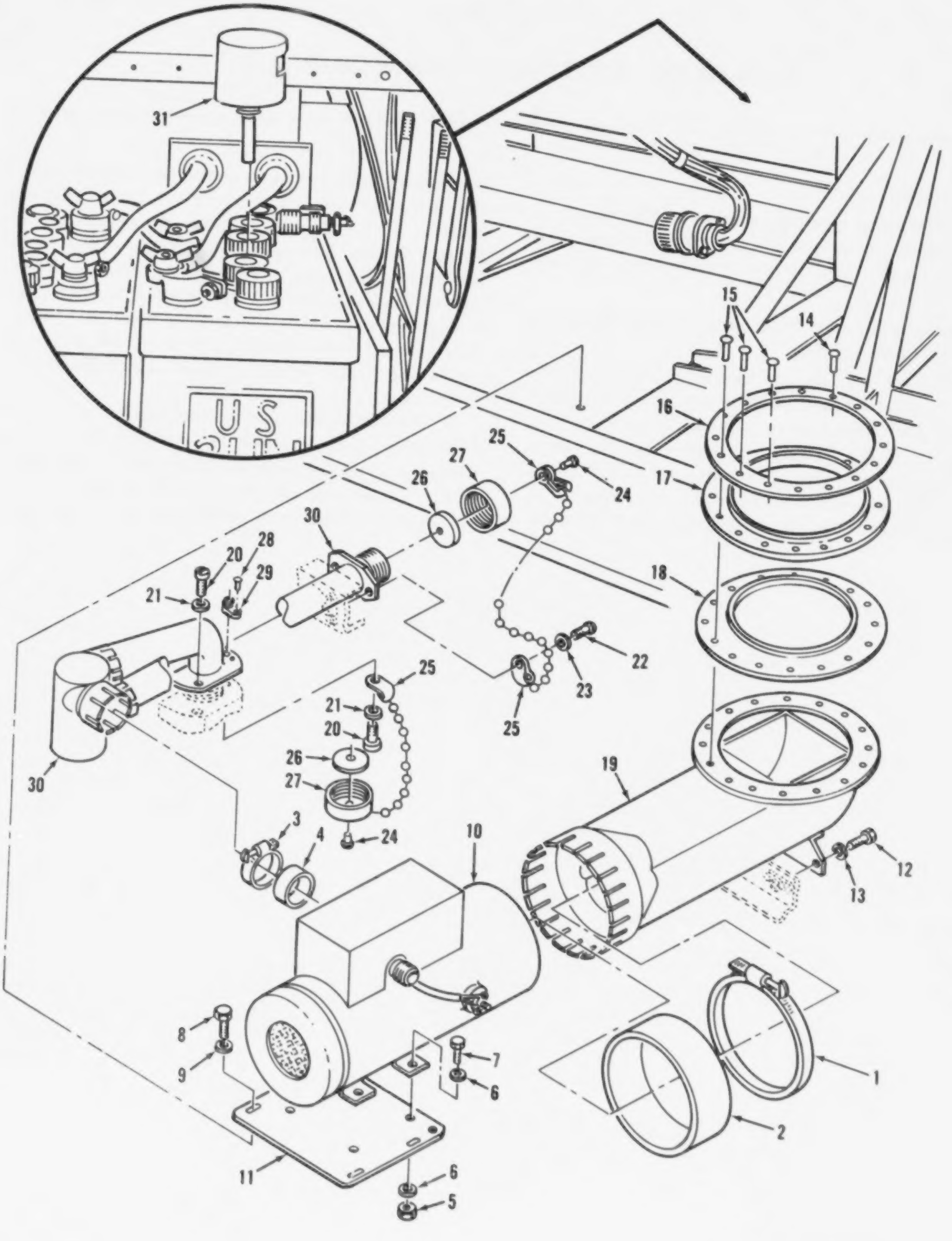
This chapter contains information on the repair of battery heater pipe assembly, heater exhaust tube assembly, and the internal combustion battery heater.

6-2. Battery Heater Pipe and Heater Exhaust Tube Assemblies

a. General. The battery heater pipe assembly is a formed and welded sheet metal duct installed between the battery heater hot air discharge and the bottom of the battery box assembly. The duct routes heated air from the battery heater to the battery box assembly to heat the batteries. The heater exhaust tube assembly is installed between the battery heater exhaust outlet and the exterior of the generator set. The duct provides alternate outlets to the exterior of the generator set for battery heater exhaust products, one outlet to the bottom of the generator set and one outlet to the left side of the generator set enclosure. Protective caps are provided to cover the outlets when not in use. The exhaust outlet to the bottom of the generator set is not usable when the fuel tank assembly is installed.

b. Removal and Installation. Refer to TM 5-6115-339-12 to remove and install the battery heater pipe and heater exhaust tube assemblies.

c. Disassembly and Reassembly. Refer to figure 6-1 to disassemble and reassemble the assemblies.



ME 6115-339-34/6-1

Figure 6-1. Winterization equipment, exploded view.

Key to figure 6-1:

1. Clamp
2. Seal
3. Clamp
4. Seal
5. Nut (4)
6. Washer (8)
7. Bolt (4)
8. Bolt (4)
9. Washer (4)
10. Internal combustion heater
11. Mounting plate
12. Bolt (2)
13. Washer (2)
14. Rivet (13)
15. Rivet (3)
16. Backing ring
17. Seal
18. Seal retainer
19. Battery heater pipe assembly
20. Screw (3)
21. Washer (3)
22. Screw (2)
23. Washer (2)
24. Rivet (2)
25. Bead chain assembly (2)
26. Gasket (2)
27. Cap (2)
28. Rivet (2)
29. Nut plate
30. Heater exhaust accumulator and tube assembly (welded)
31. Battery electrolyte temperature sensor

6-3. Internal Combustion Battery Heater

a. General. The battery heater is a light weight compact internal combustion, liquid fuel burning heater, used for heating the two-twelve volt batteries of the generator set. The battery heater is designed to operate on the same fuel used by the generator set at extreme low temperatures without modification of adjustment to the fuel system.

b. Removal and Installation. Refer to TM 5-6115-339-12 to remove and install the internal combustion heater.

c. Disassembly. Refer to figure 6-2 to disassemble the heater. Tag wires as necessary to aid in reassembly.

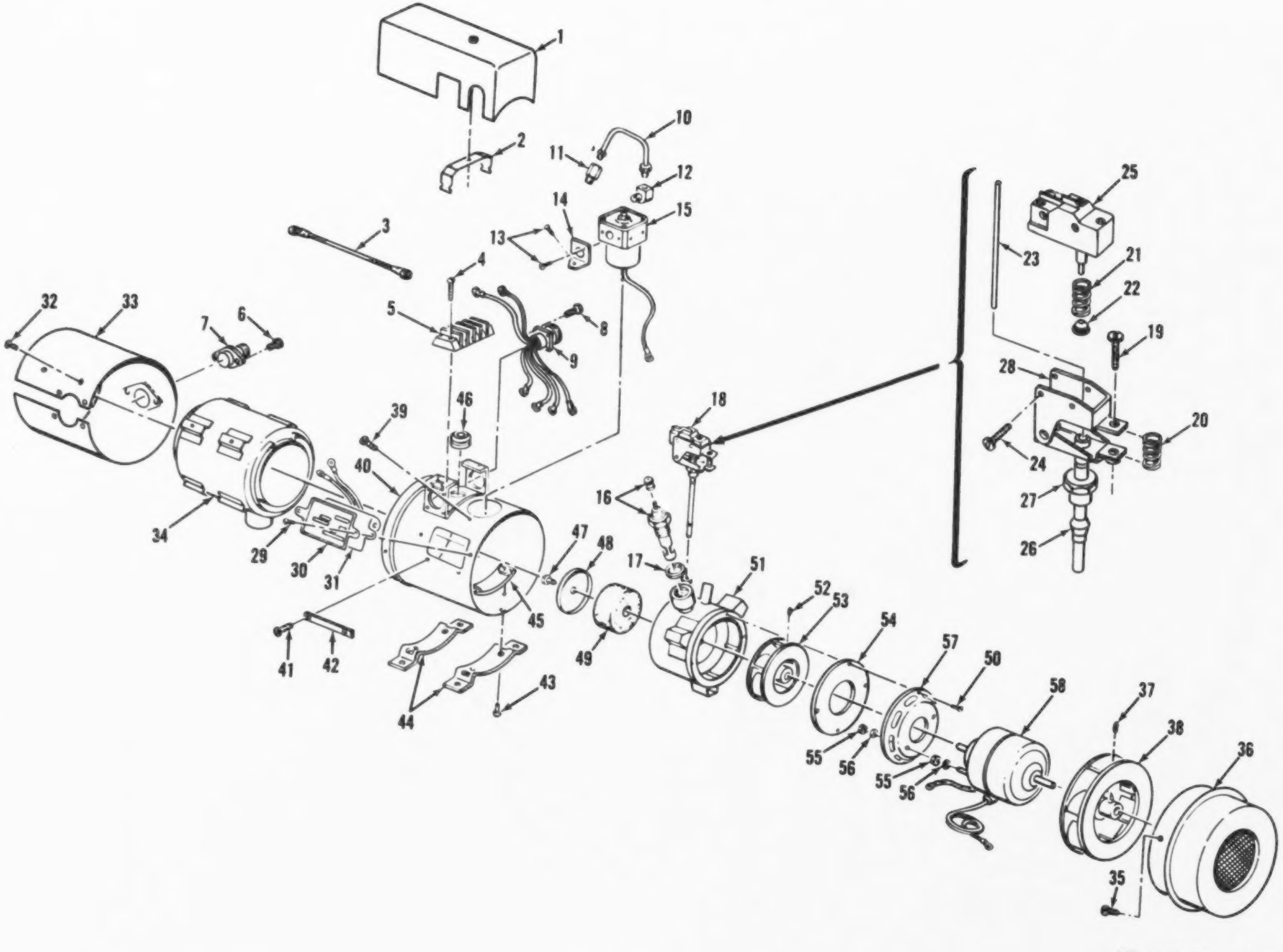


Figure 6-2. Battery heater, exploded view.

Key to figure 6-2:

1. Cover
2. Saddle bracket
3. Wire and terminals (5)
4. Terminal block screw (4)
5. Terminal block
6. Limit switch screw (2)
7. Limit switch
8. Receptacle screw (4)
9. Receptacle
10. Fuel tube assembly
11. Fuel tube connector
12. Metering orifice assembly
13. Screw (6)
14. Fuel control valve bracket (2)
15. Fuel control valve assembly
16. Igniter assembly
17. Igniter gasket
18. Flame switch assembly
19. Adjusting screw
20. Adjusting screw spring
21. Tension spring
22. Spring pad
23. Quartz rod
24. Micro switch screw (2)
25. Micro switch
26. Compression sleeve
27. Switch frame mounting nut
28. Switch frame assembly
29. Screw (2)
30. Nameplate
31. Resistor assembly
32. Screw (14)
33. Combustion chamber casing
34. Combustion chamber assembly
35. Screw (3)
36. Air inlet cover
37. Fan setscrew (2)
38. Air inlet fan assembly
39. Screw (2)
40. Burner casing assembly
41. Screw (2)
42. Plate, identification
43. Screw (4)
44. Mounting bracket (2)
45. Mounting bracket support assembly (2)
46. Casing grommet
47. Screw
48. Vaporizer retainer
49. Ceramic vaporizer
50. Burner screw (4)
51. Burner assembly
52. Fan setscrew
53. Combustion air fan assembly
54. Inlet plate
55. Air inlet nut (4)
56. Washer (4)
57. Combustion air inlet
58. Motor assembly

d. Cleaning, Inspection, and Repair.

(1) Clean all electrical parts with a clean cloth moistened in approved cleaning solvent and allow to dry. Clean all other metal parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect all parts for cracks, breaks, and other damage. Inspect receptacle assembly for bent pins and frayed insulation on leads. Inspect resistor for charring and deterioration. Inspect solenoid coil for deterioration and frayed insulation on leads. Replace defective parts.

(3) Inspect receptacle assembly (9) for continuity between wires and terminal pins with an ohmmeter.

(4) Inspect orifice assembly (12) for obstruction in orifice. Orifice diameter should be 0.010 inch.

(5) Check resistance of solenoid coil of fuel control valve assembly (15), which should be between 206 and 226 ohms.

(6) Inspect igniter (16) for broken coil or short. Check resistance, which should be 1.0 ohm with igniter cold.

(7) Inspect resistor (31) for broken coil or short. Check resistance, which should be 0.8 ohm with resistor cold.

(8) Inspect combustion chamber assembly (34) for warpage or burned condition.

(9) Inspect casings (33, 40) for burned or damaged condition.

(10) Inspect fans (38, 53) for loose or damaged blades.

(11) Inspect burner assembly (51) for burned or damaged condition.

(12) Inspect motor assembly (58) for burned or frayed lead insulation.

(13) Replace all gaskets and ceramic vaporizer (49) at each overhaul.

(14) Replace all parts that do not meet inspection or test requirements.

e. Reassembly. Reassemble battery heater in reverse order of disassembly procedure using figure 6-2 as a guide, and observing the following:

(1) Use care when replacing quartz rod (23) as it is easily broken if dropped. After replacing, gently raise and lower the rod to see that it moves freely in the stainless tube. Make certain that at least 1 / 32 inch extends out of tube when the rod is resting on bottom.

(2) Assemble the motor assembly (58), combustion air inlet (57), inlet plate (54), and combustion air fan (53) before installing in burner assembly (51).

(3) Make certain the lead wire from motor assembly (58) is on the side of the blower opposite resistor (31) before drawing it up through grommet (46).

NOTE

Nameplate (30) is secured with the same screws (29) which fasten resistor (31) to casing (33).

(4) Make certain all wire leads are connected to their respective terminals as tagged during disassembly. Refer to figure 6-3 for electrical connection.

f. Bench Test. Perform a bench test on the heater as follows:

NOTE

The following subparagraphs cover testing of individual components of the heater and it is assumed that when these components are tested and are within specifications the heater should function normally.

(a) Fuel control valve assembly test. Connect a fuel supply (3 to 4 psi) and the rated voltage to the fuel control valve assembly (15, fig. 6-2). Control valve should operate and produce a steady stream of 11 to 13 cubic centimeters of fuel per minute. If the fuel rate is not within these tolerances, replace the complete control valve. Test can be made using a graduated beaker and a stop watch.

(b) Igniter test. With igniter (16) removed from the heater, ground the igniter and apply 12 v dc power only to the igniter terminal. Igniter should draw between 9 and 11 amperes and heat to a bright red color in a few seconds. Replace igniter if requirements are not met.

(c) Resistor test. Connect terminals of resistor (31) to a 12v dc power supply in series with an ammeter. The resistor should draw between 11 and 13 ampers. Replace resistor if not within this range.

(d) Igniter and resistor test. The igniter (16) and resistor (31) can also be checked together as a unit as follows. Connect the igniter and resistor in series than apply 24v dc to the input side of the resistor and ground the other wire to the igniter body (not the igniter terminal). The igniter voltage should be between 12 and 13 volts. This test can also be made on the heater without removing the igniter, if a voltmeter is available, by checking voltage between igniter terminals and ground.

(e) Motor assembly test. The motor assembly (58) can be tested when installed in the heater. To check end play of motor shaft, grasp fan hub of fresh air fan and rotate in either direction, simultaneously moving in and out. The end play should not exceed 1 / 32 inch and fan should rotate freely. Motor rpm should be checked with a strobe light while blower is assembled to heater. The fan speed should be between 6,600 and 7,000 rpm when 24v dc power is applied. The motor should not draw more than 3.0 amperes. Higher amperage indicates a defective motor.

(f) Flame switch assembly test (fig. 6-3 and 6-4). Test flame switch assembly using an ohmmeter to check continuity of the micro switch. Depress the micro switch button. This will be the "ignition" or start position of the switch. Continuity should be made between the two NO terminals and also between each of the NO terminals and the common terminal. There should be an open circuit between the two NC terminals, and also between the common terminal and the two NC terminals. Release the micro switch button. This will be the "run" position of the micro switch. Continuity should be made between the two NC terminals and also between the two NC terminals and the common terminal. There should be no continuity made between the NO "ignition" or start terminals or with the NO terminals and the common terminal. Replace micro switch if requirements are not met.

NOTE

The common terminal is connected to the motor which operates at all times when the heater is in operation.

(g) Flame switch assembly adjustment (fig. 6-4). To adjust flame switch assembly, turn adjusting screw (19, fig. 6-2) slowly clockwise until a click is heard. Back the adjusting screw off until another click is heard. (This indicates switch is operating properly). Turn clockwise very slowly until a click is heard. Note the exact spot (screw slot) that this occurs, and turn the screw an additional ½ (180°) turn. The switch is now adjusted for heater operation.

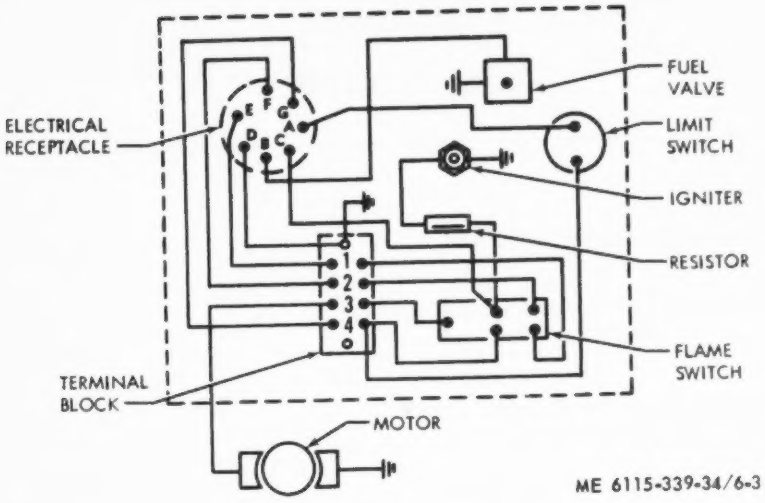


Figure 6-3. Battery heater electrical wiring schematic.

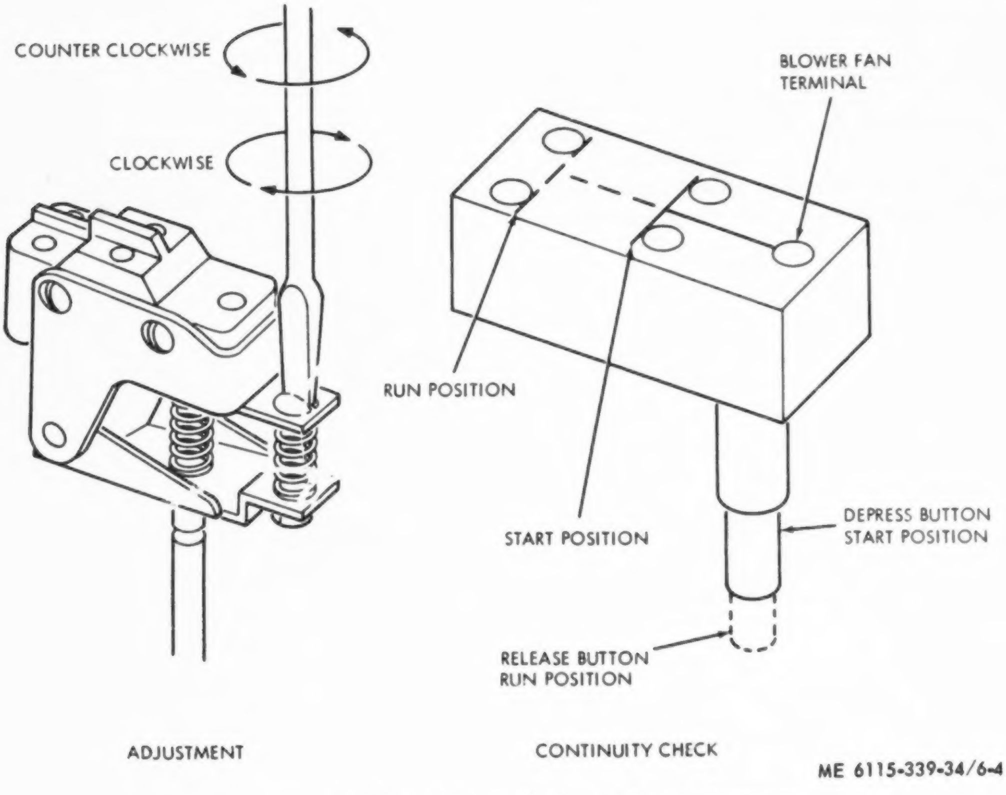


Figure 6-4. Flame switch continuity check and adjustment.

APPENDIX A

REFERENCES

1. Fire Protection	
TB 5-4200-200-10	Hand Portable Fire Extinguishers for Army Users
2. Lubrication	
C9100IL	Fuels, Lubricants, Oils and Waxes
LO 5-6115-339-12	Lubrication Order
3. Painting	
TM 9-213	Painting Instructions for Field Use
4. Cleaning	
SB 725-7930-1	Hard and Soft Water Cleaning Compounds
5. Maintenance	
TM 5-764	Electric Motor and Generator Repair
TM 5-4920-200-15	Operator, Organizational, Direct and General Support and Depot Maintenance, Engine Analyzer, Gas Turbine
TM 38-750	Army Maintenance Management System
TM 11-483	Radio Interference Suppression
TM 5-6115-339-12	Operator and Organizational Maintenance Manual for Generator Set
TM 5-6115-339-35P	Direct and General Support and Depot Maintenance Repair Parts and Special Tools Lists

INDEX

A

	Paragraph	Page
AC generator	2-13,4-1	2-32,4-1
AC power receptacle, 400 hertz	4-14	4-17
AC wiring harness, generator set	4-17	4-19
Acceleration and overtemperature control thermostat	3-17	3-31
Accessory assembly	3-23	3-43
Accessory assembly nut and torque data	1-6	1-1
Accessory assembly repair and replacement standards	1-6	1-1
Air valve, auxiliary tank bleed	5-10	5-18
Analyzer, gas turbine engine	2-5	2-8
Anticipation control, governor-load	4-6	4-8
Assembly (compressor)	3-26	3-48
Atomizer assembly, fuel	3-21	3-39
Auxiliary fuel pump and motor assembly	5-5	5-12
Auxiliary tank assembly	5-12	5-18
Auxiliary tank bleed air valve	5-10	5-18
Auxiliary tank float switch	5-9	5-18

B

	Paragraph	Page
Battery charger	4-20	4-27
Battery heater	6-3	6-3
Battery heater, internal combustion	6-3	6-3
Battery heater pipe assembly and heater exhaust tube assembly	6-2	6-1
Bleed air valve, auxiliary tank	5-10	5-18
Branched wiring harness assembly, cubicle AC	4-18	4-21
Branched wiring harness assembly, cubicle DC	4-19	4-24
Branched wiring harness assembly, generator set	4-17	4-19
Bypass solenoid valve, thermostat	3-9	3-18

C

	Paragraph	Page
Centrifugal switch assembly	3-14	3-24
Charger, battery	4-20	4-27
Circuit breaker, main	4-10	4-12
Classification and rating:		
Fuel control unit	1-6	1-1
Low oil pressure switch	1-6	1-1
Oil pressure sequencing switch	1-6	1-1
Starter assembly	1-6	1-1
Thermostat bypass solenoid	1-6	1-1
Combustion assembly	3-20	3-34
Combustion assembly repair and replacement standards	1-6	1-1
Compressor assembly	3-26	3-48
Compressor assembly nut and bolt torque data	1-6	1-1
Compressor assembly repair and replacement standards	1-6	1-1
Control, governor-load anticipation	4-6	4-8
Controls, instrument panel assembly, engine	4-11	4-13
Control unit, fuel	3-7	3-16
Convenience receptacle J19, protection fuse and fuseholder	4-15	4-18
Cubicle AC branched wiring harness assembly	4-18	4-21
Cubicle DC branched wiring harness assembly	4-19	4-24
Current transformer	4-8	4-10

D

	Paragraph	Page
Description	1-5	1-1
Disassembly (compressor assembly)	3-26	3-48
Distribution panel assembly, and voltage charge	4-9	4-11
Drain valve, fuel	5-13	5-19

E

	Paragraph	Page
Electrical controls instrument panel	4-11	4-13
Electrical equipment rack assembly	4-12	4-14
Electrical lead assembly, ignitor plug	3-3	3-7
Enclosure assembly, tank	5-14	5-21
Engine analyzer gas turbine	2-7	2-23
Engine controls instrument panel assembly	4-11	4-13
Engine, gas turbine	2-12	2-25
Exhaust tube assembly, heater	6-2	6-1

F

	Paragraph	Page
Filter assembly, oil	5-16	5-29
Fittings, hose and tube assemblies and plumbing	3-4	3-7
Float switch, auxiliary tank	5-9	5-18
Float switch, high level	5-6	5-12
Float switch, low level	5-7	5-17
Float switch, low, low level	5-8	5-17
Fuel atomizer assembly	3-21	3-39
Fuel control unit	3-7	3-16
Fuel control unit classification and rating	1-6	1-1
Fuel drain valve	5-13	5-19
Fuel pump and motor assembly, auxiliary	5-5	5-12
Fuel pump and motor assembly, main	5-11	5-18
Fuel shutoff solenoid valve	3-8	3-18
Fuel tank assembly, disassembly and reassembly	5-13	5-19
Fuel tank assembly, removal and installation	2-14	2-33
Fuel tank base wiring harness	5-2	5-1
Fuse holder	4-15	4-18

G

	Paragraph	Page
Gas turbine branched wiring harness	3-2	3-1
Gas turbine engine analyzer	2-5	2-8
Gas turbine engine, removal and installation	2-12	2-25

	Paragraph	Page
Gear assembly, planetary	3-24	3-47
General:		
Accessory assembly and planetary gear assembly	3-22	3-43
Alternating current receptacle	4-13	4-17
Compressor assembly	3-25	3-48
Engine accessories	3-5	3-11
Engine combustion and turbine assemblies	3-19	3-34
Engine wiring and plumbing	3-1	3-1
Fuel supply system accessories	5-4	5-12
Fuel supply system wiring	5-1	5-1
Generator set test instructions	2-7	2-23
Removal and installation of major components	2-11	2-25
Troubleshooting	2-4	2-8
Wiring harness	4-16	4-19
Generator, AC	2-13,4-1	2-32,4-1
Generator set AC wiring harness	4-17	4-19
Generator, tachometer	3-13	3-23
Generator set test instruction	2-7	2-23
Governor-load anticipation control	4-6	4-8

H

	Paragraph	Page
Harness assembly, cubicle AC branched wiring	4-18	4-21
Harness assembly, cubicle DC branched wiring	4-19	4-24
Harness assembly, fuel tank base wiring	5-2	5-1
Harness assembly, gas turbine branched wiring	3-2	3-1
Harness assembly, generator set branched wiring	4-17	4-19
Heater, battery	6-3	6-3
Heater exhaust tube assembly	6-2	6-1
Heater, internal combustion	6-3	6-3
Heater, pipe assembly	6-2	6-1
High level float switch	5-6	5-12
High voltage test	2-7	2-23
Hose and tube assemblies and plumbing fittings	3-4,5-3, 5-15	3-7,5-6, 5-26

I

	Paragraph	Page
Igniter plug	3-3	3-7
Igniter plug electrical lead assembly	3-3	3-7
Ignition unit	3-10	3-18
Installation, compressor assembly	3-26	3-48
Instruments, check	2-7	2-23
Instrument panel assembly controls	4-11	4-13
Internal combustion battery heater	6-3	6-3

L

	Paragraph	Page
Lead assembly, igniter plug electrical	3-3	3-7
Load anticipation control, governor	4-6	4-8
Low level float switch	5-7	5-17
Low, low level float switch	5-8	5-17
Low oil pressure switch	3-11	3-18
Low oil pressure switch classification and rating	1-6	1-1

M

	Paragraph	Page
Main circuit breaker	4-10	4-12
Main fuel pump and motor assembly	5-11	5-18
Maximum power test	2-7	2-23

N

	Paragraph	Page
Nut and bolt torque data	1-6	1-1

O

	Paragraph	Page
Oil filter assembly	5-16	5-29
Oil pressure sequencing switch	3-12	3-21
Oil pressure switch, low	3-11	3-18
Oil pump assembly	3-16	3-29
Oil tank assembly	3-15	3-26
Overcurrent relay (K14)	4-10	4-12

P

	Paragraph	Page
Panel assembly, engine controls	4-11	4-13
Pipe assembly, battery heater	6-2	6-1
Planetary gear assembly	3-24	3-47
Plug assembly (P14)	4-15	4-18
Plug, igniter	3-3	3-7
Plumbing fittings, hose and tube assemblies	3-4,5-3,5-15	3-7,5-6,5-26
Power receptacle, 400 hertz	4-14	4-17
Practical wiring diagram	1-6	1-1
Pressure switch, low oil	3-11	3-18
Protection fuse	4-15	4-18
Protective device checks	2-7	2-23
Pump assembly, oil	3-16	3-29
Pump and motor assembly, auxiliary fuel	5-5	5-12
Pump and motor assembly, main fuel	5-11	5-18

R

	Paragraph	Page
Rack assembly, electrical equipment	4-12	4-14
Range of voltage adjustment checks	2-7	2-23
Receptacle (J14)	4-15	4-18
Receptacle (J15)	4-21	4-29
Receptacle (J19)	4-15	4-18
Receptacle, 400 hertz	4-14	4-17
Record and report forms	1-2	1-1
Regulator assembly, voltage	4-2	4-4
Relay, overcurrent (K14)	4-10	4-12
Remote control test	2-7	2-23
Remote control receptacle	4-15	4-18
Removal (compressor assembly)	3-26	3-48
Repair and replacement standards	1-6	1-1

S

	Paragraph	Page
Schematic wiring diagram	1-6	1-1
Scope	1-1	1-1
Sequencing switch, oil pressure	3-12	3-21
Shorting plug assembly (P14)	4-15	4-18
Slave receptacle (J15)	4-21	4-29
Solenoid valve, fuel shutoff	3-8	3-18
Solenoid valve, thermostat bypass	3-9	3-18
Special tools and equipment	2-2	2-1
Starter assembly	3-6	3-11
Switch assembly, centrifugal	3-14	3-24
Switch, auxiliary tank float	5-9	5-18
Switch, high level float	5-6	5-12
Switch, low level float	5-7	5-17
Switch, low, low level float	5-8	5-17

	Paragraph	Page
Switch, low oil pressure	3-11	3-18
Switch, oil pressure sequencing	3-12	3-21

T

	Paragraph	Page
Tabulated data	1-6	1-1
Tachometer generator	3-13	3-23
Tank assembly, auxiliary	5-12	5-18
Tank assembly, fuel	2-14,5-13	2-33,5-19
Tank assembly, oil	3-15	3-26
Tank enclosure assembly	5-14	5-21
Tank float switch, auxiliary	5-9	5-18
Terminal board assembly	4-7	4-9
Test instructions, generator set	2-7	2-23
Thermocouple	3-18	3-33
Thermostat, acceleration and over-temperature control	3-17	3-31
Thermostat, bypass solenoid valve	3-9	3-18
Tools and equipment, special	2-2	2-1
Transformers, current	4-8	4-10
Troubleshooting equipment, use of special	2-5	2-8
Tube assemblies and plumbing fittings hose	3-4,5-3, 5-15	3-7,5-6, 5-26
Tube assembly, heater exhaust	6-2	6-1
Turbine assembly	3-21	3-39

U

	Paragraph	Page
Use of special troubleshooting equipment	2-5	2-8

V

	Paragraph	Page
Valve, auxiliary tank bleed air	5-10	5-18
Valve, fuel drain	5-13	5-19
Valve, fuel shutoff solenoid	3-8	3-18
Valve, thermostat bypass solenoid	3-9	3-18
Voltage change and distribution panel assembly	4-9	4-11
Voltage regulator assembly	4-2	4-4

W

	Paragraph	Page
Winterization equipment	6-1	6-1
Wiring diagram, practical	1-6	1-1
Wiring diagram, schematic	1-6	1-1
Wiring harness assembly, cubicle AC branched	4-18	4-21
Wiring harness assembly, cubicle DC branched	4-19	4-24
Wiring harness assembly, fuel tank base	5-2	5-1
Wiring harness assembly, gas turbine branched	3-2	3-1
Wiring harness assembly, generator set	4-17	4-19

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

VERNE L. BOWERS,
Major General, United States Army,
The Adjutant General.

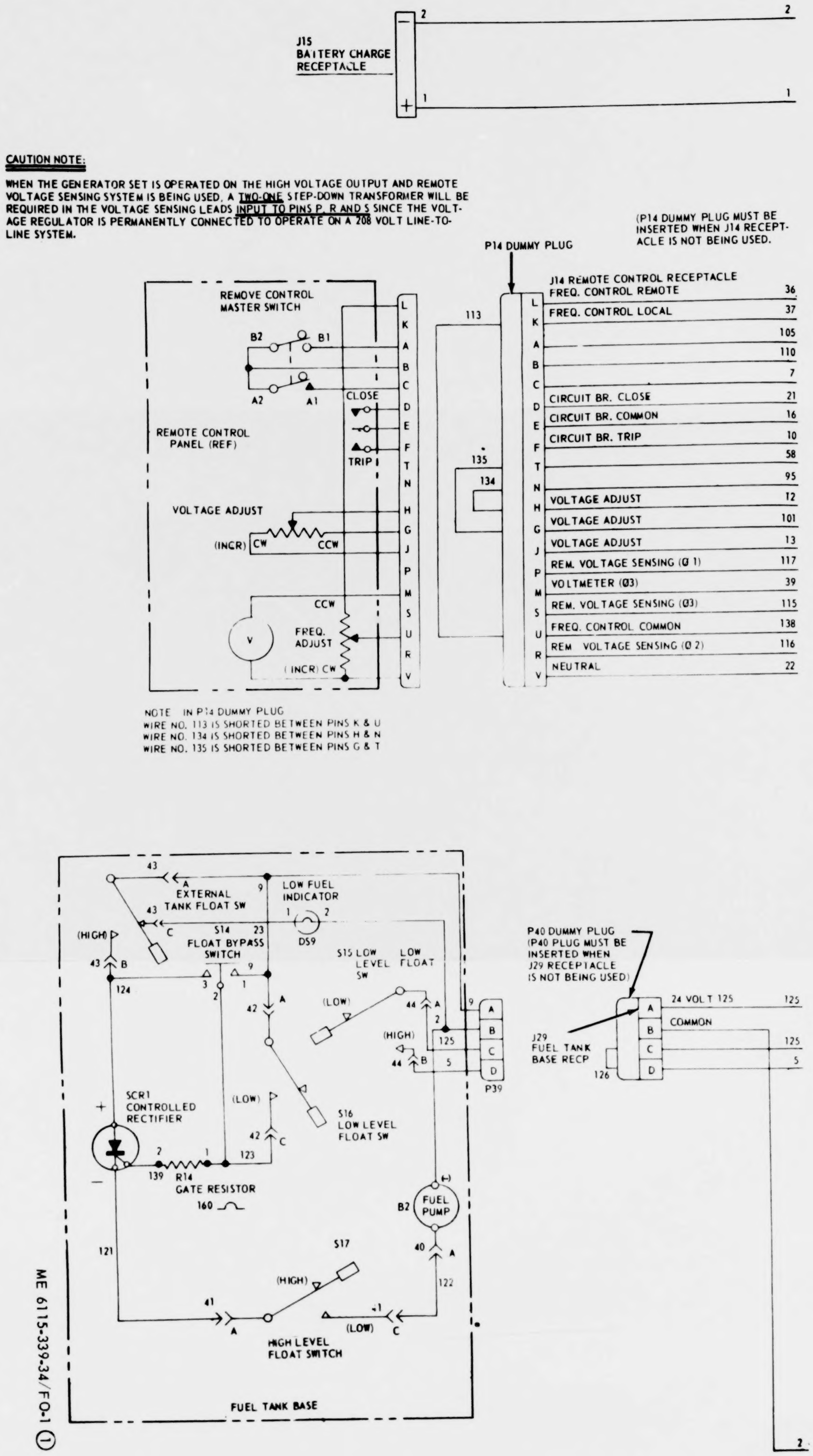
Distribution:

To be distributed in accordance with DA Form 12-25, Section IV (qty rqr block no. 771) Direct and General Support Maintenance requirements for Motor Generator Sets, 60 KW.

☆ U. S. GOVERNMENT PRINTING OFFICE : 1991 O - 281-486 (41125)

Charts Transposed to

End of Volume.



CAUTION NOTE:

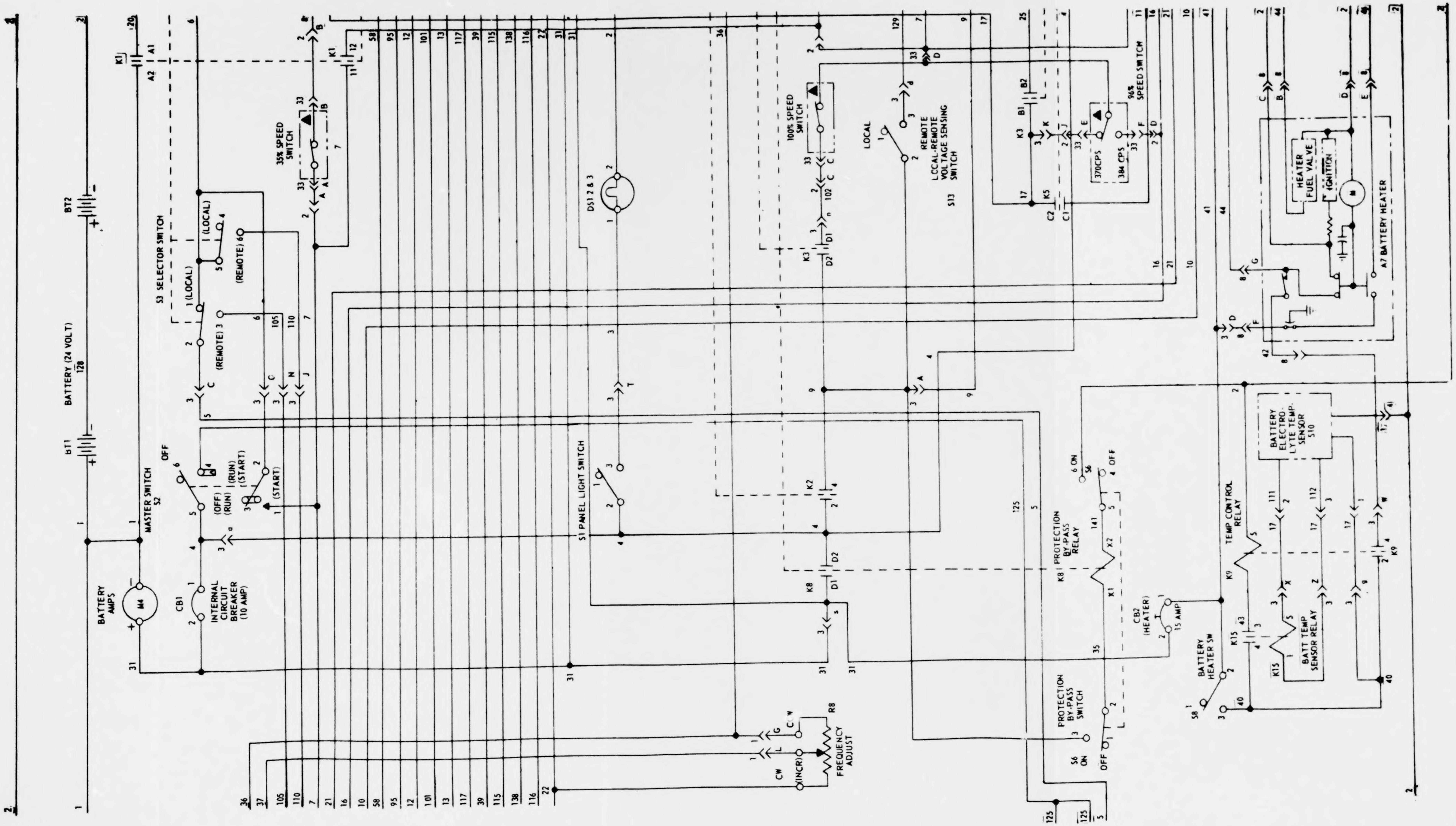
WHEN THE GENERATOR SET IS OPERATED ON THE HIGH VOLTAGE OUTPUT AND REMOTE VOLTAGE SENSING SYSTEM IS BEING USED, A TWO-ONE STEP-DOWN TRANSFORMER WILL BE REQUIRED IN THE VOLTAGE SENSING LEADS INPUT TO PINS P, R AND S SINCE THE VOLTAGE REGULATOR IS PERMANENTLY CONNECTED TO OPERATE ON A 208 VOLT LINE-TO-LINE SYSTEM.

NOTE IN P14 DUMMY PLUG
WIRE NO. 113 IS SHORTED BETWEEN PINS K & U
WIRE NO. 134 IS SHORTED BETWEEN PINS H & N
WIRE NO. 135 IS SHORTED BETWEEN PINS G & T

ME 6115-339-34/FO-1 ①

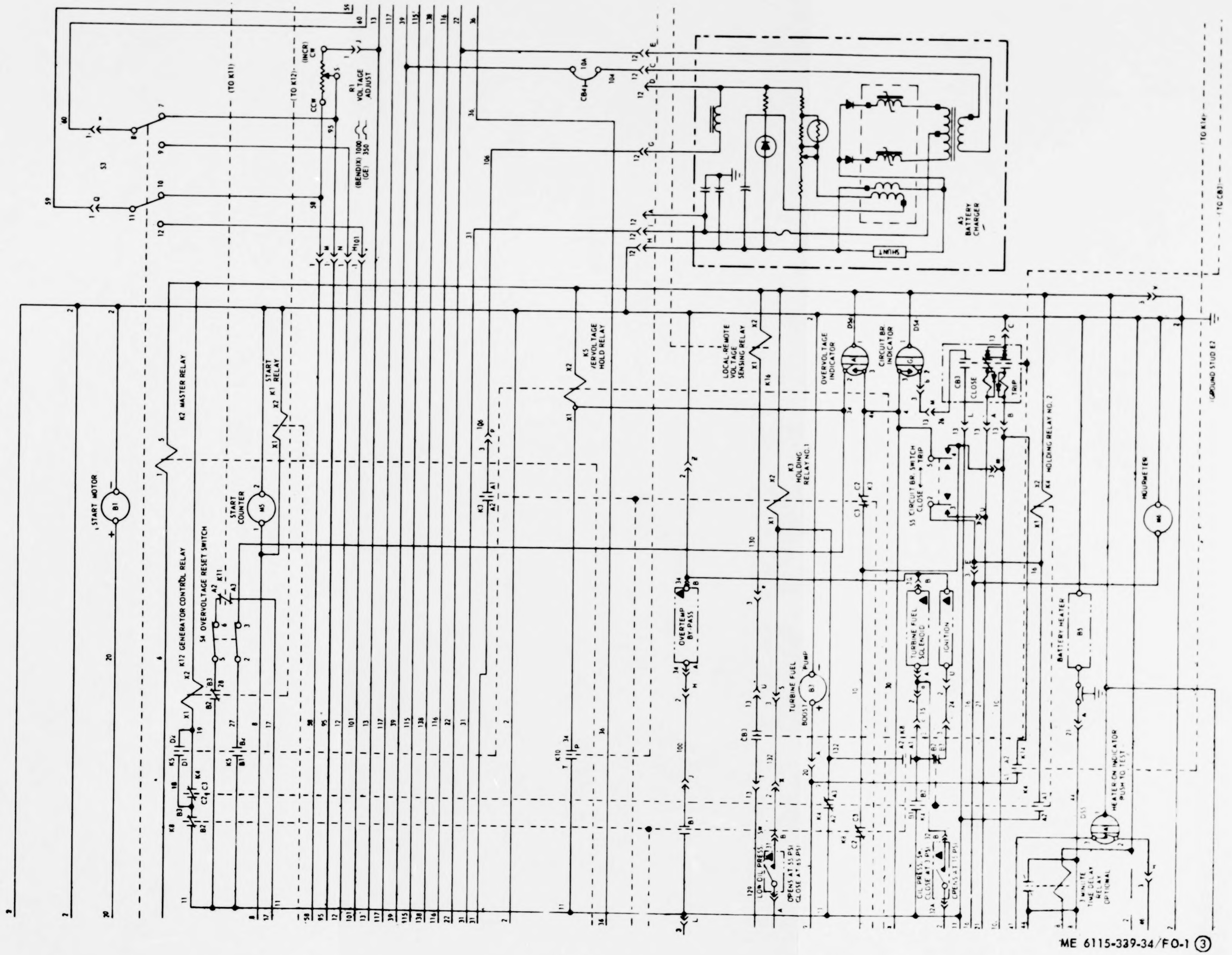
FO-1. Generator set schematic wiring diagram. (Sheet 1 of 7).

best copy available



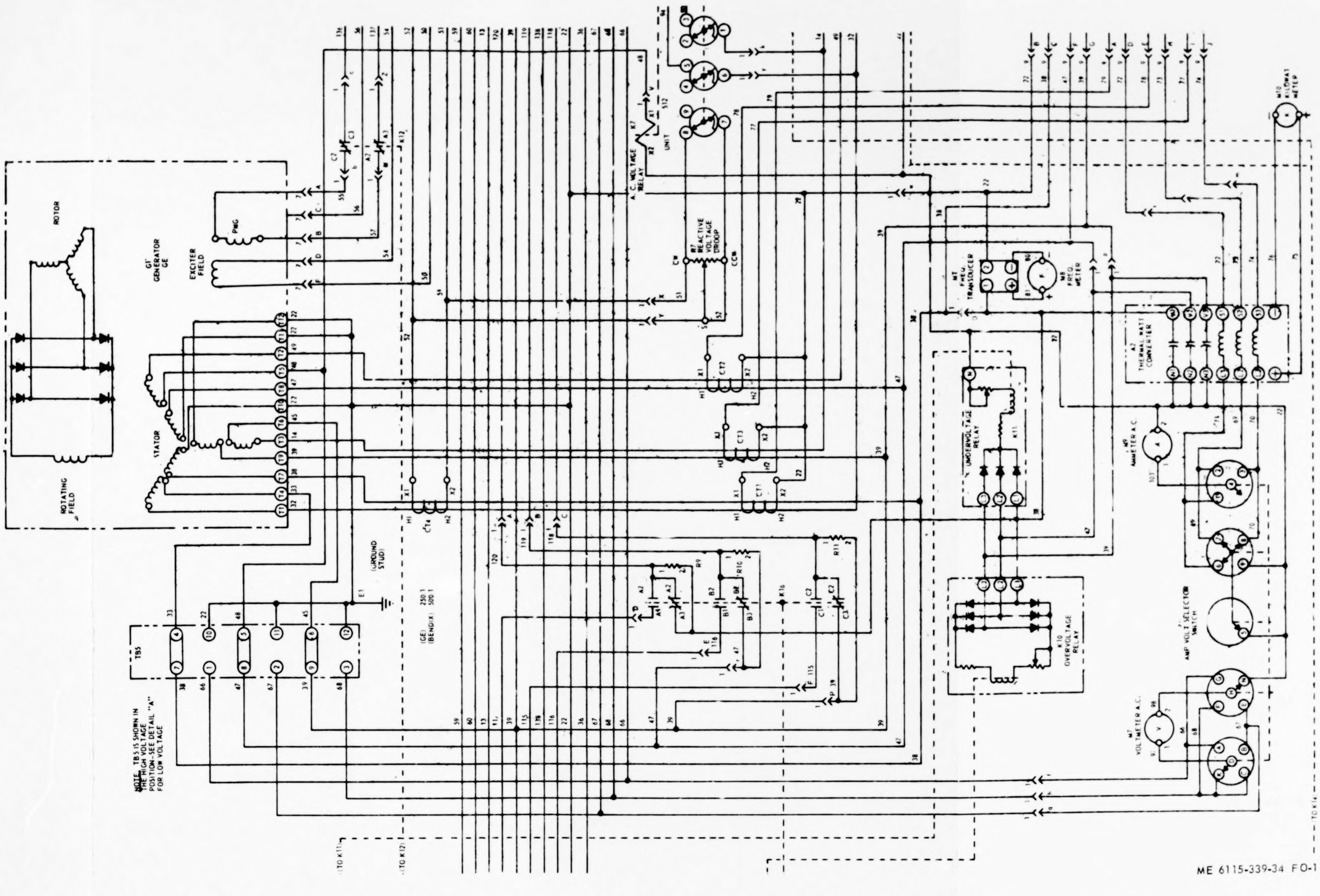
ME 6115-339-34/FO-1 ②

FO-1. Generator set schematic wiring diagram. (Sheet 2 of 7).



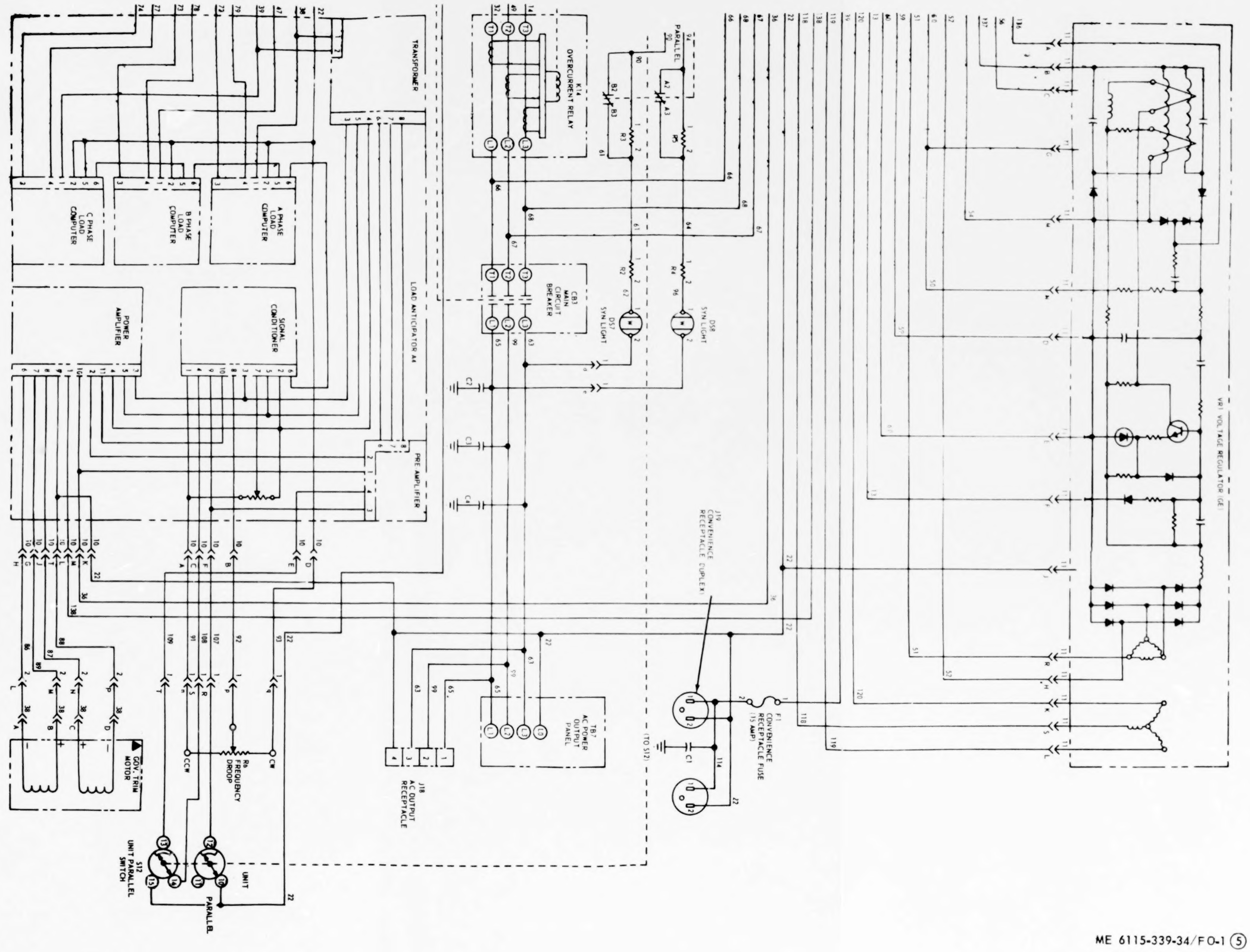
ME 6115-339-34/FO-1 ③

FO-1. Generator set schematic wiring diagram. (Sheet 3 of 7).

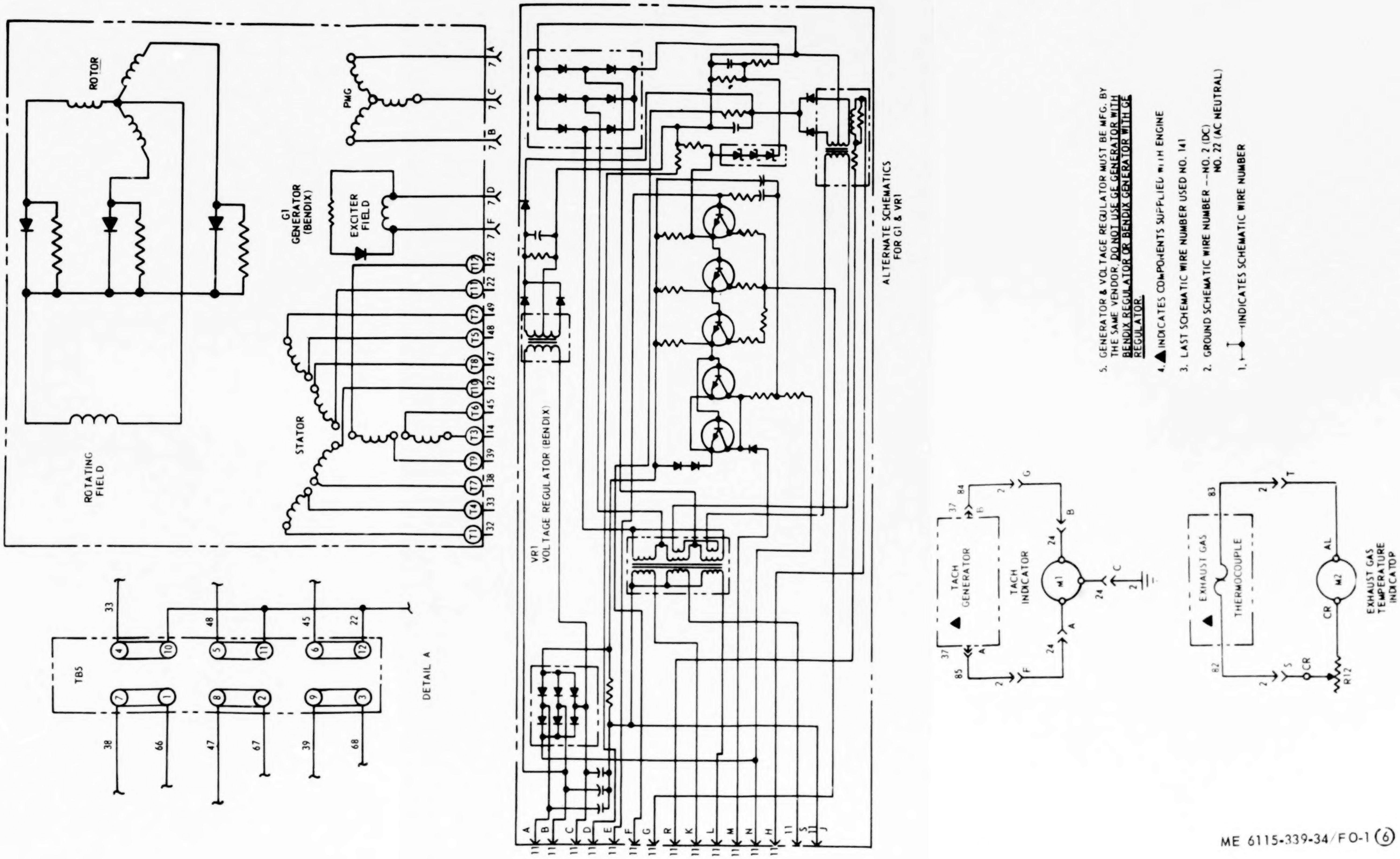


ME 6115-339-34 FO-1 ④

FO-1. Generator set schematic wiring diagram. (Sheet 4 of 7).



FO-1. Generator set schematic wiring diagram. (Sheet 5 of 7).



1. ⊢•— INDICATES SCHEMATIC WIRE NUMBER
2. GROUND SCHEMATIC WIRE NUMBER — NO. 2 (DC) NO. 22 (AC NEUTRAL)
3. LAST SCHEMATIC WIRE NUMBER USED NO. 141
4. ▲ INDICATES COMPONENTS SUPPLIED WITH ENGINE
5. GENERATOR & VOLTAGE REGULATOR MUST BE MFG. BY THE SAME VENDOR. DO NOT USE GE GENERATOR WITH BENDIX REGULATOR OR BENDIX GENERATOR WITH GE REGULATOR.

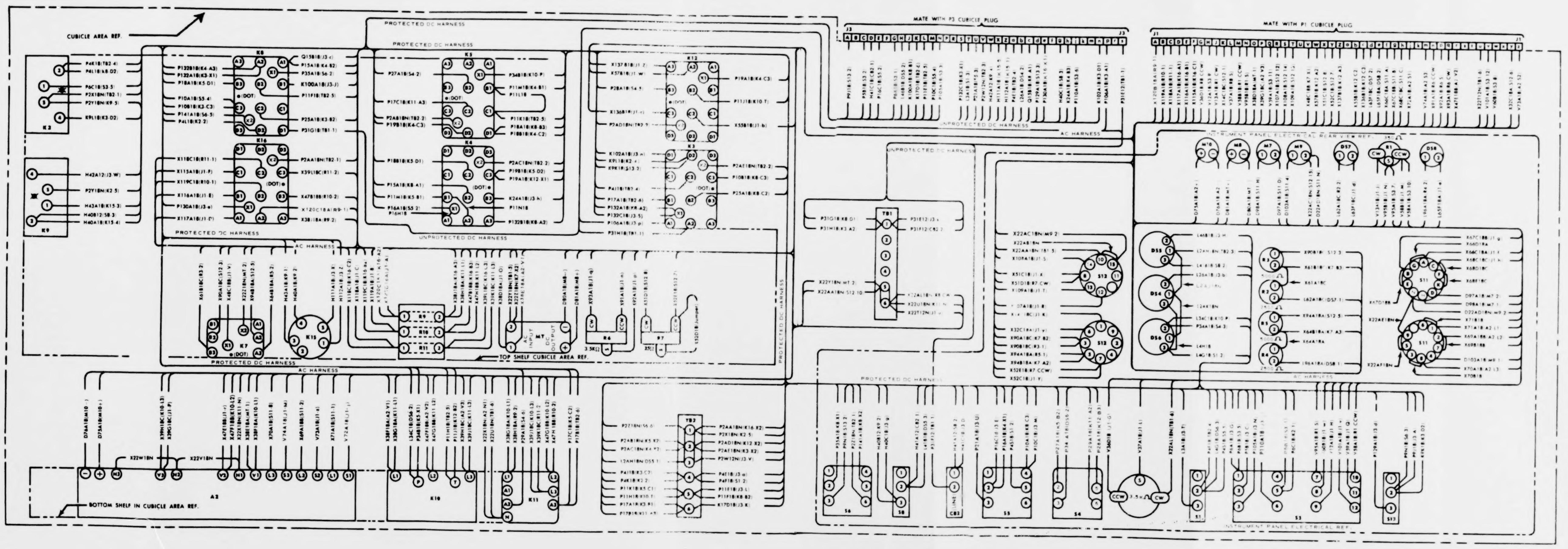
ME 6115-339-34/FO-1 ⑥

FO-1. Generator set schematic wiring diagram. (Sheet 6 of 7).

A2	Thermal Watt Converter
A4	Load Anticipator
A5	Battery Charger
A7	Battery Heater
A7B1	Heater Fan Motor
A7C1	Capacitor (Radio Noise Suppression), 0.005 MFD, 600 V DC
A7C2	Capacitor (Radio Noise Suppression), 0.01 MFD, 100 V DC
A7R1	Resistor, 0.8 Ohm, 300 Watt
A7S1	Heater Limit Switch
A7S2	Heater Flame Switch
B1	Starter Motor
B2	Fuel Tank Auxiliary Fuel Pump
B3	Main Fuel Pump
B5	Heater Fuel Pump
BT1	Battery, 12 Volts
BT2	Battery, 12 Volts
C1	Capacitor (Radio Noise Suppression), 0.1 MFD, 500 V AC-DC
C2	Capacitor (Radio Noise Suppression), 0.1 MFD, 500 V AC-DC
C3	Capacitor (Radio Noise Suppression), 0.1 MFD, 500 V AC-DC
C4	Capacitor (Radio Noise Suppression), 0.1 MFD, 500 V AC-DC
CB1	Internal Circuit Breaker, 10 Amp
CB2	Winterization Heater Circuit Breaker
CB3	Main Circuit Breaker
CB3CR1	Semiconductor Device, Diode
CB3CR2	Semiconductor Device, Diode
CB3CR3	Semiconductor Device, Diode
CB3CR4	Semiconductor Device, Diode
CB4	Circuit Breaker, 10 Amp
CT1	Current Transformer (Instrumentation)
CT2	Current Transformer (Instrumentation)
CT3	Current Transformer (Instrumentation)
CT4	Current Transformer (Voltage Droop)
DS1	Panel Lights Lamp
DS2	Panel Lights Lamp
DS3	Panel Lights Lamp
DS4	Main CB Closure Lamp
DS5	Winterization Heater Lamp
DS6	Over Voltage Lamp
DS7	Syn Light Lamp
DS8	Syn Light Lamp
DS9	Low Fuel Indicator Lamp
E1	AC-DC External Ground Stud
E2	Internal Ground Stud
F1	Convenience Receptacle Fuse, 15 Amp
F2	Battery Charger Fuse
G1	AC Generator
J1	Control Receptacle
J3	Control Receptacle
J14	Remote Control General Receptacle
J15	24 V DC Slave Receptacle
J18	400 Cycle Power Receptacle
J19	120 V – 400 Cycle – 15 Amp Convenience Receptacle (Duplex)
J29	Fuel Tank Base Receptacle
K1	Starter Relay
K2	Master Relay
K3	Holding Relay No. 1
K4	Holding Relay No. 2
K5	Over Voltage Hold Relay
K7	AC Voltage Relay
K8	Protection Bypass Relay
K9	Temperature Control Relay
K10	Over Voltage Relay
K10CR1	Semiconductor Device, Diode
K10CR2	Semiconductor Device, Diode
K10CR2	Semiconductor Device, Diode
K10CR3	Semiconductor Device, Diode
K10CR4	Semiconductor Device, Diode
K10CR5	Semiconductor Device, Diode
K10CR6	Semiconductor Device, Diode
K10R1	Resistor, Adjustable, 3000 Ohm, 10 Watt
K10R2	Resistor, 7000 Ohm, 5 Watt
K11	Under Voltage Relay
K11CR1	Semiconductor Device, Diode
K11CR2	Semiconductor Device, Diode
K11CR3	Semiconductor Device, Diode
K11R1	Resistor, 35000 Ohm, 10 Watt
K12	Generator Control Relay
K14	Overcurrent (Short Circuit) Relay
K15	Battery Temperature Sensing Relay
K16	Local-Remote Voltage Sensing Relay
M1	Tachometer Indicator
M2	Exhaust Gas Temperature Indicator
M3	Oil Pressure Gage
M4	Battery Charging Ammeter
M5	Start Counter
M6	Time Totalizing Meter
M7	AC Voltmeter
M8	Frequency Meter
M9	AC Ammeter
M10	Kilowatt Meter
MT	Frequency Transducer
PMG	Permanent Magnet Generator
P1	Control Plug
P2	Gas Turbine Engine Control Plug
P3	Control Plug
P7	AC Generator Plug
P8	Battery Heater Plug
P9	Load Anticipator Plug
P10	Load Anticipator Plug
P11	Voltage Regulator Plug
P12	Battery Charger Plug
P13	Main Circuit Breaker (CB3) Plug
P14	Internally Wired Dummy Plug
P17	Battery Electrolyte Temperature Sensor Plug
P20	Fuel Boost Pump Plug
P21	Battery Heater Fuel Pump Plug
P24	Tachometer Indicator Plug
P39	Fuel Tank Base Plug
P40	Internally Wired Dummy Plug
P41	High Level Float Switch Plug
P42	Low Level Float Switch Plug
P43	External Float Switch Plug
P44	Low Low Level Float Switch Plug
R1	Voltage Adjust Rheostat, 350 Ohms, 12.5 Watt
R2	Resistor (Synchronizing Light), 2500 Ohms, 10 Watt
R3	Resistor (Synchronizing Light), 5000 Ohms, 10 Watt
R4	Resistor (Synchronizing Light), 2500 Ohms, 10 Watt
R5	Resistor (Synchronizing Light), 500 Ohms, 10 Watt
R6	Frequency Droop Rheostat, 3500 Ohms, 12.5 Watt
R7	Reactive Voltage Droop Rheostat, 25 Ohms, 25 Watt
R8	Frequency Adjust Potentiometer, 3500 Ohms, 3 Watt
R9	Resistor, 1000 Ohms, 1 Watt
R10	Resistor, 1000 Ohms, 1 Watt
R11	Resistor, 1000 Ohms, 1 Watt
R12	Resistor, 15 Ohms, 10 Watt
R14	Resistor, 160 Ohms, 8 Watt
SCR1	Silicon Controlled Rectifier
S1	Panel Lights Switch
S2	Master Switch
S3	Local-Remote Control Selector Switch
S4	Over Voltage Reset Switch
S5	Main CB Circuit Breaker Switch
S6	Protection Bypass Switch
S8	Winterization Heater Switch
S10	Battery Electrolyte Temperature Sensor
S11	Volt – Amp Selector Switch
S12	Unit-Parallel Selector Switch
S13	Local-Remote Sensing Voltage Selector Switch
S14	Float Bypass Switch
S15	Low Low Level Float Switch
S16	Low Level Float Switch
S17	High Level Float Switch
S18	External Tank Float Switch
TB1	Terminal Board
TB2	Terminal Board
TB3	Terminal Board
TB4	Terminal Board
TB5	Voltage Change Panel
TB7	AC Power Output Terminal Board
VR1	Voltage Regulator
VR1C2	Capacitor, 2.0 MFD, 15 V DC
VR1C3	Capacitor, 6 MFD, 150 V DC
VR1C4	Capacitor, 0.2 MFD, 200 V DC
VR1C6	Capacitor, 0.047 MFD, 400 V DC
VR1CR1A through F	Semiconductor Device, Diode
VR1CR2	Semiconductor Device, Diode
VR1CR3	Semiconductor Device, Zener Diode
VR1CR4A through D	Semiconductor Device, Diode
VR1CR5	Semiconductor Device, Diode
VR1L1	Reactor Coil, 12.0 H
VR1L2	Reactor Coil, 2.0 H
VR1Q1	Semiconductor Device, Transistor
VR1R1	Resistor, 100 K Ohm, 1 Watt
VR1R2	Resistor, 3900 Ohm, 25 Watt
VR1R3	Resistor, 270 Ohm, 3 Watt
VR1R5	Resistor, 2700 Ohm, 3 Watt
VR1R6	Resistor, 4700 Ohm, 3 Watt
VR1R7	Resistor, 34 Ohm, 2 Watt
VR1R8	Resistor, 2200 Ohms, 3 Watt
VR1R9	Resistor, 2.7 K Ohm, 3 Watt
VR1R10	Resistor, 3.9 K Ohm, 3 Watt
VR1R11	Resistor, 5 Ohm, 25 Watt
VR1R12	Resistor, 220 Ohm, 5 Watt
VR1SX1	Magnetic Amplifier
VR1T1	Transformer

ME 6115-339-34/FO-1 ⑦

FO-1. Generator set schematic wiring diagram. (Sheet 7 of 7).

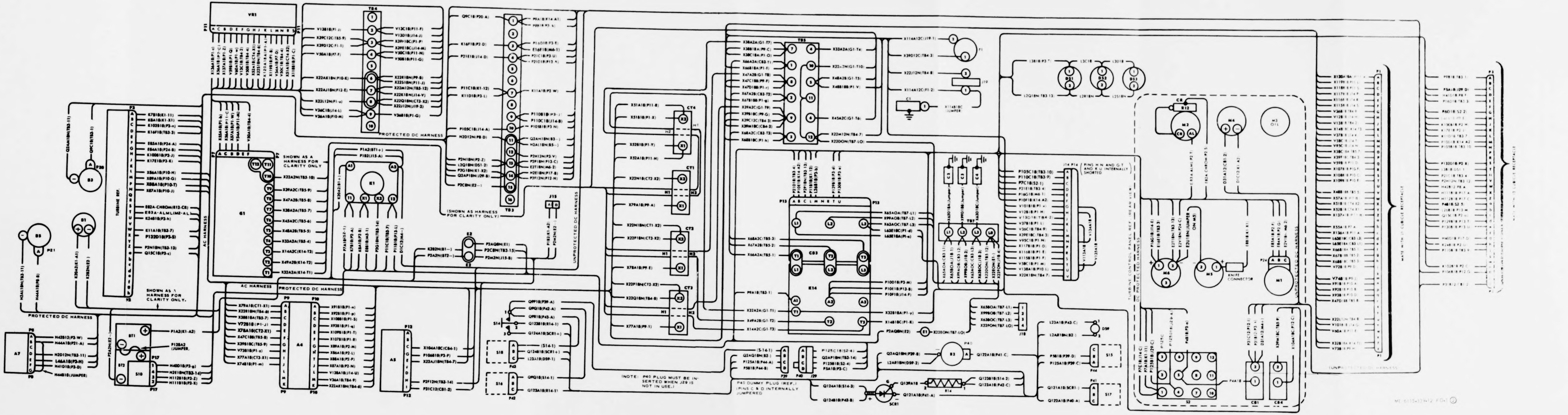


A2	Thermal Watt Converter
A4	Load Anticipator
A5	GOVERNOR CONTROL TRANSFORMER RECTIFIER
A7	Battery Heater
B1	Starter Motor
B2	TURBINE FUEL BOOST PUMP
B3	BATTERY
B5	Heater Fuel Pump
BT1	Battery, 12 Volts
BT2	Battery, 12 Volts
C1	Capacitor (Radio Noise Suppression) 0.1 MFD, 500 VAC DC
C2	Capacitor (Radio Noise Suppression) 0.1 MFD, 500 VAC DC
C3	Capacitor (Radio Noise Suppression) 0.1 MFD, 500 VAC DC
C4	Capacitor (Radio Noise Suppression) 0.1 MFD, 500 VAC DC
CB1	Internal Circuit Breaker, 10 Amp
CB2	Winterization Heater Circuit Breaker
CB3	Main Circuit Breaker
CB4	BATTERY CHARGER
CT1	Current Transformer (Instrumentation)
CT2	Current Transformer (Instrumentation)
CT3	Current Transformer (Instrumentation)
CT4	Current Transformer (Voltage Droop)
CT5	Current Transformer
DS1	Panel Lights Lamp
DS2	Panel Lights Lamp
DS3	Panel Lights Lamp
DS4	MAIN CB INDICATOR LAMP
DS5	Winterization Heater Lamp
DS6	OVER VOLTAGE INDICATOR LAMP
DS7	Syn Light Lamp
DS8	Syn Light Lamp
DS9	Low Fuel Indicator Lamp
E1	AC DC External Ground Stud
E2	Internal Ground Stud
F1	Convenient Receptacle Fuse, 15 Amp
G1	AC Generator
J1	CUBICLE RECEPTACLE
J3	CUBICLE RECEPTACLE
J14	Remote Control General Receptacle
J15	BATTERY CHARGE RECEPTACLE
J18	AC OUTPUT RECEPTACLE
J19	120V - 400 Cycle - 15 Amp Convenience Receptacle Duplex
J29	Fuel Tank Base Receptacle
K1	Starter Relay
K2	Master Relay
K3	Holding Relay No. 1
K4	Holding Relay No. 2
K5	Over Voltage Hold Relay
K7	AC Voltage Relay
K8	Protection By Pass Relay
K9	Temperature Control Relay
K10	Over Voltage Relay AC
K11	Under Voltage Relay AC
K12	Generator Control Relay
K14	Overcurrent (Short Circuit) Relay
K15	Battery Temperature Sensing Relay
K16	Local Remote Voltage Sensing Relay
M1	Tachometer Indicator
M2	Exhaust Gas Temperature Indicator
M3	Oil Pressure INDICATOR
M4	Battery Charging Ammeter
M5	Start Counter
M6	Time Totalizing Meter
M7	AC Voltmeter
M8	Frequency Meter
M9	AC Ammeter
M10	Kilowatt Meter
MT	Frequency Transducer
P1	CUBICLE RECEPTACLE PLUG
P2	TURBINE CONTROL PLUG
P3	CUBICLE RECEPTACLE PLUG
P7	AC Generator Plug
P8	Battery Heater Plug
P9	Load Anticipator Plug
P10	Load Anticipator Plug
P11	Voltage Regulator Plug
P12	TRANSFORMER RECTIFIER PLUG
P13	Main Circuit Breaker (CB3) Plug
P14	Internally Wired Dummy Plug
P17	Battery Electrolyte Temperature Sensor P
P20	TURBINE FUEL BOOST PUMP PLU
P21	Battery Heater Fuel Pump Plug
P24	Tachometer Indicator Plug
P39	Fuel Tank Base Plug
P40	Internally Wired Dummy Plug
P41	High Level Float Switch Plug
P42	Low Level Float Switch Plug
P43	External Float Switch Plug
P44	Low Low Level Float Switch Plug
R1	Voltage Adj Rheostat 350 Ohms 12.5 Wat
R2	Resistor Synchronizing Light 2500 Ohms
R3	Resistor Synchronizing Light 5000 Ohms
R4	Resistor Synchronizing Light 2500 Ohms
R5	Resistor Synchronizing Light 5000 Ohms
R6	Frequency Droop Rheostat 3500 Ohms 12
R7	Reactive Voltage Droop Rheostat 25 Ohms
R8	Frequency Adj Potentiometer 3500 Ohms
R9	Resistor 1000 Ohms 1 Watt
R10	Resistor 1000 Ohms 1 Watt
R11	Resistor 1000 Ohms 1 Watt
R12	Resistor 25 Ohms 10 Watt
R14	Resistor 140 Ohms 8 Watt
SCR1	Silicon Controller Rectifier
S1	Panel Lights Switch
S2	Master Switch
S3	Local Remote Control Selector Switch
S4	Over Voltage Reset Switch
S5	Main CB Circuit Breaker Switch
S6	Protection By Pass Switch
S8	Heater Switch
S10	[illegible]
S11	Kilo Amp Selector Switch
S12	Unit Parallel Selector Switch
S13	Local Remote Sensing Voltage Selector Switch
S14	Float By Pass Switch
S15	Low Low Level Float Switch
S16	Low Level Float Switch
S17	High Level Float Switch
S18	External Tank Float Switch
TB1	Terminal Board
TB2	Terminal Board
TB3	Terminal Board
TB4	Terminal Board
TB5	Voltage Change Panel
TB7	AC Power Output
VR1	Voltage Regulator

ME 6115-339-12 FO-1 ①

FIG 2. Generator set practical wiring diagram (Sheet 1 of 3)

FO



FO-2. Generator set practical wiring diagram. (Sheet 2 of 3)

POINT TO POINT VOLTAGE AND RESISTANCE VALUES FOR TEST PURPOSES AND REFERENCE INFORMATION

NOTE: ALL SWITCHES ARE IN OFF POSITION AND
ALL CIRCUIT BREAKERS ARE CLOSED
UNLESS OTHERWISE INDICATED.

A. ENCLOSURE EXTERNAL CONNECTORS

REFERENCE POINTS FROM	REFERENCE POINTS TO	VOLTAGE	OHMS	REMARKS: CIRCUIT BREAKER REF DES	CIRCUIT BREAKER POSITION	GENERATOR SET	SWITCH REF DES	SWITCH POSITION
J15-(+)	J15-(-)	+28 VDC	NA			RUNNING	S2	ON
J29-A	J29-B	+28 VDC	NA			RUNNING	S2	ON
J29-C	J29-B	+28 VDC	NA			RUNNING	S2	ON
J18-1	J18-4	120 VAC (400 CYCLES)	NA	CB-4 CB-3	OPEN CLOSED	RUNNING		
J18-2	J18-4	120 VAC (400 CYCLES)	NA	CB-4 CB-3	OPEN CLOSED	RUNNING		
J18-3	J18-4	120 VAC (400 CYCLES)	NA	CB-4 CB-3	OPEN CLOSED	RUNNING		
TB7-L1	TB7-L0	120 VAC (400 CYCLES)	NA	CB-4 CB-3	OPEN CLOSED	RUNNING		
TB7-L2	TB7-L0	120 VAC (400 CYCLES)	NA	CB-4 CB-3	OPEN CLOSED	RUNNING		
TB7-L3	TB7-L0	120 VAC (400 CYCLES)	NA	CB-4 CB-3	OPEN CLOSED	RUNNING		
J19-1	J19-2	120 VAC (400 CYCLES)	NA	CB-4 CB-3	OPEN CLOSED	RUNNING		
J15-(+)	J15-(−)	+24 VDC	NA	CB-3	OPEN		S2 S12	OFF UNIT
J29-A	J29-B	0	INFINITY	CB-3	OPEN		S2 S12	OFF UNIT
J29-C	J29-B	0	INFINITY	CB-3	OPEN		S2 S12	OFF UNIT
J18-1	J18-4	0	INFINITY	CB-3	OPEN		S12 S2	UNIT OFF
J18-2	J18-4	0	INFINITY	CB-3	OPEN		S12 S2	UNIT OFF
J18-3	J18-4	0	INFINITY	CB-3	OPEN		S12 S2	UNIT OFF
TB7-L1	TB7-L0	0	INFINITY	CB-3	OPEN		S12 S2	UNIT OFF
TB7-L2	TB7-L0	0	INFINITY	CB-3	OPEN		S12 S2	UNIT OFF
TB7-L3	TB7-L0	0	INFINITY	CB-3	OPEN		S12 S2	UNIT OFF
J19-1	J19-2	0	0	CB-3	OPEN		S12 S2	UNIT OFF
J18-1	J18-4	0	2600	CB-3	OPEN		S12 S2	UNIT OFF
J18-2	J18-4	0	INFINITY	CB-3	OPEN		S12 S2	PARALLEL OFF
P14-K	P14-U	0	0	CB-3	OPEN		S12 S2	PARALLEL OFF
P14-T	P14-G	0	0	CB-3	OPEN		S12 S2	UNIT OFF
P14-N	P14-H	0	0	CB-3	OPEN		S12 S2	UNIT OFF
ALL OTHERS	ANY	0	INFINITY	CB-3	OPEN		S12 S2	UNIT OFF
J14-L	J14-V	0	1350	CB-3	OPEN		S12 S2	UNIT OFF

REFERENCE POINTS FROM	REFERENCE POINTS TO	VOLTAGE	OHMS	REMARKS: CIRCUIT BREAKER REF DES	CIRCUIT BREAKER POSITION	GENERATOR SET	SWITCH REF DES	SWITCH POSITION
J14-K	J14-V	0	1220	CB-3	OPEN		S2 S12	OFF UNIT
J14-A	J14-V	0		CB-3	OPEN		S2 S12	OFF UNIT
J14-B	J14-V	0	INFINITY	CB-3	OPEN		S2 S12	OFF UNIT
J14-C	J14-V	0	38	CB-3	OPEN		S2 S12	OFF UNIT
J14-D	J14-V	0	3.1	CB-3	OPEN		S2 S12	OFF UNIT
J14-E	J14-V	0	3.1	CB-3	OPEN		S2 S12	OFF UNIT
J14-F	J14-V	0	9.1	CB-3	OPEN		S2 S12	OFF UNIT
J14-J	J14-V	0	INFINITY	CB-3	OPEN		S2 S12	OFF UNIT
J14-P	J14-V	0	INFINITY	CB-3	OPEN		S2 S12	OFF UNIT
J14-M	J14-V	0	0	CB-3	OPEN		S2 S12	OFF UNIT
J14-S	J14-V	0	INFINITY	CB-3	OPEN		S2 S12	OFF UNIT
J14-U	J14-V	0	2.7K	CB-3	OPEN		S2 S12	OFF UNIT
J14-R	J14-V	0	INFINITY	CB-3	OPEN		S2 S12	OFF UNIT
J14-G	J14-V	0	INFINITY	CB-3	OPEN		S2 S12	OFF UNIT
J18-3	J18-4	0	2600	CB-3	OPEN		S2 S12	OFF PARALLEL
TB7-L1	TB7-L0	0	2600	CB-3	OPEN		S2 S12	OFF PARALLEL
TB7-L2	TB7-L0	0	INFINITY	CB-3	OPEN		S2 S12	OFF PARALLEL
TB7-L3	TB7-L0	0	2600	CB-3	OPEN		S2 S12	OFF PARALLEL

B. AC GENERATOR (G1)

FROM	TO	VOLTAGE	OHMS	REMARKS
T1	T4	0	0.0220 TO 0.0244	
T2	T5	0	0.0220 TO 0.0244	
T3	T6	0	0.0220 TO 0.0244	
T7	T10	0	0.0220 TO 0.0244	
T8	T11	0	0.0220 TO 0.0244	
T9	T12	0	0.0220 TO 0.0244	
J7-A	J7-B	0	1.0	
J7-D	J7-F	0	20.0	
J7-C & E	ANY OTHER	0	INFINITY	

C. VOLTAGE REGULATOR (VR1)

FROM	TO	VOLTAGE	OHMS	REMARKS
J11-A	J11-N	0	620	CONNECT POSITIVE LEAD TO A PIN
J11-B	J11-N	0	630	CONNECT POSITIVE LEAD TO B PIN
J11-A	J11-N	0	INFINITY	CONNECT NEGATIVE LEAD TO A PIN
J11-B	J11-N	0	INFINITY	CONNECT NEGATIVE LEAD TO B PIN
J11-M	J11-N	0	1900	CONNECT POSITIVE LEAD TO M PIN
J11-M	J11-N	0	INFINITY	CONNECT NEGATIVE LEAD TO M PIN
J11-M	J11-D	0	0	
J11-M	J11-E	0	0	
J11-F	J11-E	0	INFINITY	CONNECT POSITIVE LEAD TO F PIN
J11-F	J11-E	0	11.5K	CONNECT NEGATIVE LEAD TO F PIN

REFERENCE POINTS FROM	REFERENCE POINTS TO	VOLTAGE	OHMS	REMARKS
J11-R	J11-E	0	6500	CONNECT POSITIVE LEAD TO R PIN
J11-H	J11-E	0	6500	CONNECT POSITIVE LEAD TO H PIN
J11-R	J11-E	0	640	CONNECT NEGATIVE LEAD TO R PIN
J11-H	J11-E	0	690	CONNECT NEGATIVE LEAD TO H PIN
J11-K	J11-S	0	34	
J11-L	J11-S	0	34	
J11-C	ANY OTHER	0	INFINITY	
J11-G	ANY OTHER	0	INFINITY	
J11-J	ANY OTHER	0	INFINITY	

D. LOAD ANTICIPATOR (A4)

FROM	TO	VOLTAGE	OHMS	REMARKS
J9-C	J9-[illegible]	0	47	
J9-F	J9-B	0	110	
J9-G	J9-B	0	36	
J9-A	J9-D	0	0.2	
J9-E	J9-H	0	0.2	
J9-I	J9-J	0	0.2	
J10-D	J9-B	0	0	
J10-E	J10-D	0	INFINITY	
J10-B	J10-D	0	INFINITY	
J10-F	J10-D	0	INFINITY	
J10-C	J10-D	0	INFINITY	
J10-A	J10-D	0	1000	CONNECT POSITIVE LEAD TO D PIN
J10-K	J10-D	0	0	
J10-M	J10-D	0	2500	
J10-L	J10-D	0	4000	
J10-T	J10-D	0	0	
J10-J	J10-D	0	650	CONNECT POSITIVE LEAD TO D PIN
J10-G	J10-D	0	650	CONNECT POSITIVE LEAD TO D PIN
J10-H	J10-D	0	0	
J10-A	J10-D		3000	CONNECT NEGATIVE LEAD TO D PIN
J10-J	J10-D		INFINITY	CONNECT NEGATIVE LEAD TO D PIN
J10-G	J10-D		INFINITY	CONNECT NEGATIVE LEAD TO D PIN

E. BATTERY CHARGER (A5)

FROM	TO	VOLTAGE	OHMS	REMARKS
J12-C	J12-E	0	0	
J12-I	J12-H	0	INFINITY	CONNECT POSITIVE LEAD TO I PIN
J12-I	J12-H	0	460	CONNECT NEGATIVE LEAD TO I PIN
J12-I	J12-A	0	0	
J12-D	J12-H	0	150	
J12-D	J12-G	0	0	

F. BATTERY HEATER (A7)

FROM	TO	VOLTAGE	OHMS	REMARKS
J8-A	J8-B	0	220	
J8-A	J8-C	0	0	
J8-A	J8-D	0	0	
J8-A	J8-G	0	0	
J8-E	ANY OTHER	0	INFINITY	
J8-F	ANY OTHER	0	INFINITY	

G. BATTERY TEMPERATURE SENSOR (S10)

FROM	TO	VOLTAGE	OHMS	REMARKS
J17-1	J17-4	0		USE R × 1000 SCALE OR HIGHER
J17-2	J17-4	0		MULTIPLIER TO PROTECT TRANSISTORS
J17-3	J17-4	0		

FO-2. Generator set practical wiring diagram. (Sheet 3 of 5).

POINT TO POINT VOLTAGE AND RESISTANCE VALUES FOR TEST PURPOSES AND REFERENCE INFORMATION

NOTE: ALL SWITCHES ARE IN OFF POSITION AND
ALL CIRCUIT BREAKERS ARE CLOSED
UNLESS OTHERWISE INDICATED.

I. CONTROL CUBICLE PLUGS (CONT)

H. CONTROL CUBICLE RECEPTACLES

REFERENCE POINTS				REMARKS				
FROM	TO	VOLTAGE	OHMS	CIRCUIT BREAKER REF DES	CIRCUIT BREAKER POSITION	GENERATOR SET	SWITCH REF DES	SWITCH POSITION
J1-A	J1-u		INFINITY					
J1-B	J1-u		INFINITY					
J1-C	J1-u		INFINITY					
J1-D	J1-u		INFINITY					
J1-E	J1-u		INFINITY					
J1-F	J1-u		INFINITY					
J1-G	J1-u		3.2K					
J1-H	J1-u		INFINITY					
J1-J	J1-u		INFINITY					
J1-K	J1-u		INFINITY					
J1-L	J1-u		1.7K					
J1-M	J1-u		INFINITY					
J1-N	J1-u		INFINITY					
J1-O	J1-u		1.7K					
J1-P	J1-u		INFINITY					
J1-Q	J1-u		INFINITY					
J1-R	J1-u		INFINITY					
J1-S	J1-u		INFINITY					
J1-T	J1-u		0					
J1-V	J1-u		2.3K					
J1-W	J1-u		INFINITY					
J1-X	J1-u		INFINITY					
J1-Y	J1-u		INFINITY					
J1-Z	J1-u		INFINITY					
J1-b	J1-u	0	INFINITY					
J1-c	J1-u	0	INFINITY					
J1-d	J1-u	0	INFINITY					
J1-e	J1-u	0	INFINITY					
J1-f	J1-u	0	INFINITY					
J1-g	J1-u	0	INFINITY					
J1-h	J1-u	0	INFINITY					
J1-j	J1-u	0	0					
J1-m	J1-u	0	0					
J1-n	J1-u	0	INFINITY					
J1-p	J1-u	0	INFINITY					
J1-q	J1-u	0	INFINITY					
J1-r	J1-u	0	INFINITY					
J1-s	J1-u	0	INFINITY					
J1-v	J1-u	0	INFINITY					
J1-w	J1-u	0	INFINITY					
J1-y	J1-u	0	INFINITY					
J1-z	J1-u	0	0					
J1-U	ANY OTHER	0	INFINITY					
J1-a	ANY OTHER	0	INFINITY					
J1-k	ANY OTHER	0	INFINITY					
J1-t	ANY OTHER	0	INFINITY					
J1-x	ANY OTHER	0	INFINITY					
J3-A	J3-V	0	INFINITY					
J3-C	J3-V	0	220					
J3-D	J3-V	0	INFINITY					
J3-E	J3-V	0	260					
J3-G	J3-V	0	220					
J3-H	J3-V	0	40					
J3-J	J3-V	0	INFINITY					
J3-K	J3-V	0	70					
J3-L	J3-V	0	70					
J3-M	J3-V	0	INFINITY					
J3-N	J3-V	0	INFINITY					
J3-P	ANY OTHER	0	INFINITY					
J3-R	ANY OTHER	0	INFINITY					
J3-S	J3-V	0	70					
J3-T	J3-V	0	INFINITY					
J3-U	J3-V	0	200			J1 AND J3 WITH BOTH P1 AND P3 DISCONNECTED		
J3-W	J3-V	0	INFINITY					
J3-X	J3-V	0	INFINITY					
J3-Z	J3-V	0	INFINITY			WITH ALL CIRCUIT BREAKERS CLOSED AND ALL SWITCHES IN OFF OR NEUTRAL POSITION. "UNIT-PARALLEL" SWITCH IN "PARALLEL" POSITION. VOLT AMP SELECTOR IN POSITION "C-A".		
J3-a	J3-V	0	INFINITY					
J3-b	J3-V	0	37					
J3-c	J3-V	0	INFINITY					
J3-d	J3-V	0	INFINITY					
J3-e	J3-V	0	200					
J3-g	J3-V	0	INFINITY					
J3-h	J3-V	0	INFINITY					
J3-j	J3-V	0	INFINITY					
J3-m	J3-V	0	150					
J3-n	J3-V	0	INFINITY					
J3-p	J3-V	0	INFINITY					
J3-r	J3-V	0	150					
J3-s	J3-V	0	INFINITY					
J3-B	ANY OTHER	0	INFINITY					
J3-F	ANY OTHER	0	INFINITY					
J3-f	ANY OTHER	0	INFINITY					
J3-k	ANY OTHER	0	INFINITY					

I. CONTROL CUBICLE PLUGS ON ENCLOSURE HARNESS

REFERENCE POINTS				REMARKS				
FROM	TO	VOLTAGE	OHMS	CIRCUIT BREAKER REF DES	CIRCUIT BREAKER POSITION	GENERATOR SET	SWITCH REF DES	SWITCH POSITION
P1-A	P1-u	0	INFINITY			BOTH P1 AND P3 DISCONNECTED		
P1-B	P1-u	0	INFINITY					
P1-C	P1-u	0	INFINITY					
P1-D	P1-u	0	INFINITY					
P1-E	P1-u	0	INFINITY					
P1-F	P1-u	0	INFINITY					
P1-G	P1-u	0	2.1K					
P1-H	P1-u	0	INFINITY					
P1-J	P1-u	0	INFINITY					
P1-K	P1-u	0	0					
P1-L	P1-u	0	3K					
P1-M	P1-u	0						
P1-N	P1-u	0						
P1-O	P1-u	0	0					
P1-P	P1-u	0	0					
P1-Q	P1-u	0	INFINITY					
P1-R	P1-u	0	INFINITY					
P1-S	P1-u	0	INFINITY					
P1-T	P1-u	0	INFINITY					
P1-V	P1-u	0	INFINITY					
P1-W	P1-u	0	0					
P1-X	P1-u	0	INFINITY					
P1-Y	P1-u	0	INFINITY					
P1-Z	P1-u	0	INFINITY					
P1-b	P1-u	0	INFINITY					
P1-c	P1-u	0	INFINITY					
P1-d	P1-u	0	INFINITY					
P1-e	P1-u	0	INFINITY					
P1-f	P1-u	0	0					
P1-g	P1-u	0	0					
P1-h	P1-u	0	0					
P1-j	P1-u	0	0					
P1-m	P1-u	0	0					
P1-n	P1-u	0	2.5K					
P1-p	P1-u	0	INFINITY					
P1-q	P1-u	0	0					
P1-r	P1-u	0	0					
P1-s	P1-u	0	INFINITY					
P1-v	P1-u	0	INFINITY					
P1-w	P1-u	0	INFINITY					
P1-y	P1-u	0	0					
P1-z	P1-u	0	0					
P1-U	ANY OTHER	0	INFINITY					
P1-a	ANY OTHER	0	INFINITY					
P1-k	ANY OTHER	0	INFINITY					
P1-t	ANY OTHER	0	INFINITY					
P1-x	ANY OTHER	0	INFINITY					
P3-A	P3-V	0	2.8					
P3-C	P3-V	0	INFINITY					
P3-D	P3-V	0	INFINITY					
P3-E	P3-V	0	2.8					
P3-G	P3-V	0	INFINITY					
P3-H	P3-V	0	INFINITY					
P3-J	P3-V	0	45.0					
P3-K	P3-V	0	INFINITY					
P3-L	P3-V	0	INFINITY					
P3-M	P3-V	0	INFINITY					
P3-N	P3-V	0	INFINITY					
P3-P	P3-V	0	INFINITY					
P3-R	P3-V	0	INFINITY					
P3-S	P3-V	0	INFINITY					
P3-T	P3-V	0	7.0					
P3-U	P3-V	0	15.0					
P3-W	P3-V	0	1.2					
P3-X	P3-V	0	INFINITY					
P3-Z	P3-V	0	INFINITY					
P3-a	P3-V	0	INFINITY					
P3-b	P3-V	0	INFINITY					
P3-c	P3-V	0	29.0					
P3-d	P3-V	0	INFINITY					
P3-e	P3-V	0	INFINITY					
P3-g	P3-V	0	INFINITY					
P3-h	P3-V	0	0.9					
P3-j	P3-V	0	INFINITY					
P3-m	P3-V	0	INFINITY					
P3-n	P3-V	0	INFINITY					
P3-p	P3-V	0	132.0					
P3-r	P3-V	0	INFINITY					
P3-s	P3-V	0	INFINITY					
P3-B	ANY OTHER	0	INFINITY					
P3-F	ANY OTHER	0	INFINITY					
P3-f	ANY OTHER	0	INFINITY					
P3-k	ANY OTHER	0	INFINITY					

FO-2. Generator set practical wiring diagram. (Sheet 4 of 5).

POINT TO POINT VOLTAGE AND RESISTANCE VALUES FOR TEST PURPOSES AND REFERENCE INFORMATION

NOTE: ALL SWITCHES ARE IN OFF POSITION AND
ALL CIRCUIT BREAKERS ARE CLOSED
UNLESS OTHERWISE INDICATED.

B. AC GENERATOR (G1) (CONT.)

J. AC CIRCUIT BREAKER (CB-3)

REFERENCE POINTS				REMARKS				
				CIRCUIT BREAKER		GENERATOR	SWITCH	
FROM	TO	VOLTAGE	OHMS	REF DES	POSITION	SET	REF DES	POSITION
J13-A	J13-C	0	16		CB3 OPEN, CONNECT POSITIVE LEAD TO A PIN			
J13-A	J13-C	0	INFINITY		CB3 OPEN, CONNECT NEGATIVE LEAD TO A PIN			
J13-B	J13-C	0	17.5		CB3 CLOSED, CONNECT POSITIVE LEAD TO B PIN			
J13-B	J13-C	0	INFINITY		CB3 CLOSED, CONNECT NEGATIVE LEAD TO B PIN			
J13-L	J13-M	0	INFINITY		WITH CB3 OPEN			
J13-N	J13-R	0	0		WITH CB3 OPEN			
J13-T	J13-U	0	INFINITY		WITH CB3 OPEN			
J13-L	J13-M	0	0		WITH CB3 CLOSED			
J13-N	J13-R	0	INFINITY		WITH CB3 CLOSED			
J13-T	J13-U	0	0		WITH CB3 CLOSED			
CB3-L1	CB3-T1	0	0		WITH CB3 CLOSED			
CB3-L2	CB3-T2	0	0		WITH CB3 CLOSED			
CB3-L3	CB3-T3	0	0		WITH CB3 CLOSED			
CB3-L1	CB3-T1	0	INFINITY		WITH CB3 OPEN			
CB3-L2	CB3-T2	0	INFINITY		WITH CB3 OPEN			
CB3-L3	CB3-T3	0	INFINITY		WITH CB3 OPEN			

K. OVERCURRENT RELAY (K14)

FROM	TO	VOLTAGE	OHMS	REMARKS
K14-L1	K14-T1	0	0	
K14-L2	K14-T2	0	0	
K14-L3	K14-T3	0	0	
K14-A1	K14-A2	0	INFINITY	
K14-A2	K14-A3	0	0	

L. STARTER RELAY (K1)

FROM	TO	VOLTAGE	OHMS	REMARKS
K1-X1	K1-X2	0	40	
K1-11	K1-12	0	INFINITY	WITH COIL DE-ENERGIZED (X1-X2)
K1-A1	K1-A2	0	INFINITY	WITH COIL DE-ENERGIZED (X1-X2)
K1-11	K1-12	0	0	WITH COIL ENERGIZED (X1-X2)
K1-A1	K1-A2	0	0	WITH COIL ENERGIZED (X1-X2)

M. GAS TURBINE

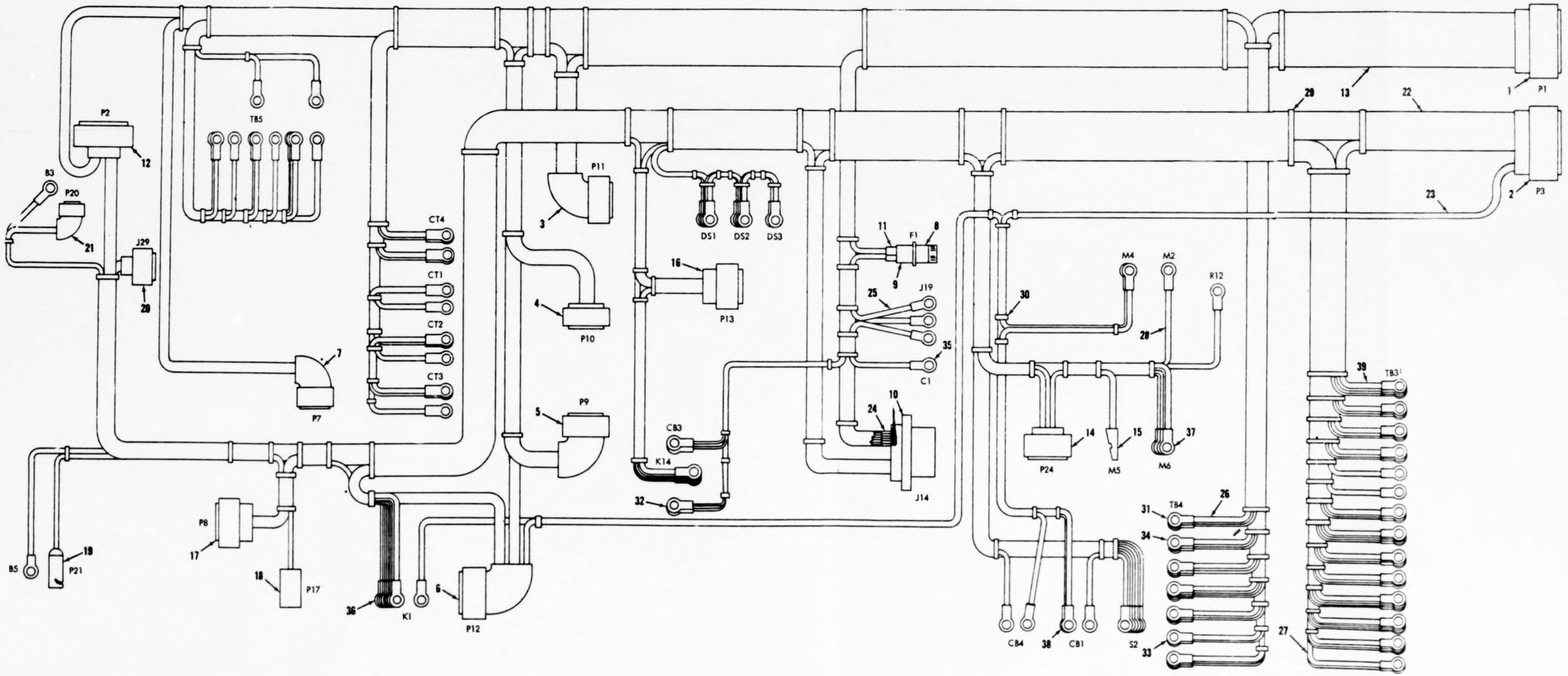
REFERENCE POINTS				REMARKS				
				CIRCUIT BREAKER		GENERATOR	SWITCH	
FROM	TO	VOLTAGE	OHMS	REF DES	POSITION	SET	REF DES	POSITION
P2-A	P2-Z	0	INFINITY					
P2-B	P2-Z	0	INFINITY					
P2-C	P2-Z	0	INFINITY					
P2-D	P2-Z	0	INFINITY					
P2-F	P2-Z	0	INFINITY					
P2-G	P2-Z	0	INFINITY					
P2-H	P2-Z	0	INFINITY					
P2-J	P2-Z	0	INFINITY					
P2-K	ANY OTHER	0	INFINITY					
P2-L	P2-Z	0	INFINITY					
P2-M	P2-Z	0	INFINITY					
P2-N	P2-Z	0	INFINITY					
P2-P	P2-Z	0	INFINITY					
P2-R	ANY OTHER	0	INFINITY					
P2-S	P2-Z	0	INFINITY					
P2-T	P2-Z	0	INFINITY					
P2-U	P2-Z	0	6					
P2-V	ANY OTHER	0	INFINITY					
P2-W	P2-Z	0	INFINITY					
P2-X	P2-Z	0	INFINITY					
P2-a	P2-Z	0	30					
P2-f	P2-Z	0	INFINITY					
P2-g	P2-Z	0	INFINITY					
P2-h	ANY OTHER	0	INFINITY					
P2-E	P2-Z	0	0					
P2-Q	P2-Z	0	INFINITY					
P2-Y	P2-Z	0	INFINITY					
P2-b	P2-Z	0	INFINITY					
P2-c	P2-Z	0	INFINITY					
P2-d	ANY OTHER	0	INFINITY					
P2-e	ANY OTHER	0	INFINITY					
P2-j	ANY OTHER	0	INFINITY					
P2-k	ANY OTHER	0	INFINITY					
P2-m	ANY OTHER	0	INFINITY					
P2-q	ANY OTHER	0	INFINITY					
P2-r	ANY OTHER	0	INFINITY					
P2-s	ANY OTHER	0	INFINITY					

N. BATTERY TEMPERATURE SENSOR (S10)

FROM	TO	VOLTAGE	OHMS	REMARKS
2	3		13,000.0	CONNECT NEGATIVE LEAD TO PIN 3
2	3		13.0	CONNECT POSITIVE LEAD TO PIN 3
1	4		220.0	CONNECT POSITIVE LEAD TO PIN 4
1	4		INFINITY	CONNECT NEGATIVE LEAD TO PIN 4
2	4		950.0	CONNECT NEGATIVE LEAD TO PIN 4
2	4		675.0	CONNECT POSITIVE LEAD TO PIN 4
3	4		9,000.0	CONNECT NEGATIVE LEAD TO PIN 4
3	4		[illegible]	CONNECT POSITIVE LEAD TO PIN 4

ME 6115-339-34/FO-2 ⑤

FO-2. Generator set practical wiring diagram. (Sheet 5 of 5).



1	Connector, plug P1
2	Connector, plug P3
3	Connector, plug P11
4	Connector, plug P10
5	Connector, plug P9
6	Connector, plug P12
7	Connector, plug P7
8	Fuse holder, convenience receptacle fuse F1
9	Fuse, 15 amp, 125 volt, convenience receptacle protection
10	Connector, receptacle J14
11	Insulation, sleeving, 1 in. long 0.166 in. id (2)
12	Connector, plug P2
13	Wiring harness assembly, generator set ac
14	Connector, plug P24
15	Connector, knife splice M5
16	Connector, plug P13
17	Connector, plug P8
18	Connector, plug P17
19	Connector, plug P21
20	Connector, receptacle J29
21	Connector, plug P20
22	Harness assembly, protected dc
23	Harness assembly, unprotected dc
24	Insulation, sleeving, 1 in. long, 0.118 in. id (20)
25	Wire, electrical, AWG no. 12, white insulated (AR)
26	Wire, electrical, AWG no. 18, white insulated (AR)
27	Wire, electrical, AWG no. 12, red insulated (AR)
28	Wire, electrical, chromel-alumel (AR)
29	Strap tie (AR)
30	Strap tie (AR)
31	Terminal, lug, no. 18 wire size (65)
32	Terminal, lug, no. 18 wire size (19)
33	Terminal, lug, no. 12 wire size (13)
34	Terminal, lug, no. 12 wire size (3)
35	Terminal, lug, no. 18 wire size (9)
36	Terminal, lug, no. 18 wire size (22)
37	Terminal, lug, no. 18 wire size (4)
38	Terminal lug, no. 12 wire size (2)
39	Wire, electrical, AWG no. 18, red insulated (AR)

ME 6115-339-34/FO-3

FO-3. Generator set wiring harness assembly.